United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with Tennessee Agricultural Experiment Station; Macon County Board of Commissioners; and the Tennessee Department of Agriculture

Soil Survey of Macon County, Tennessee

How to Use This Soil Survey

General Soil Map

The general soil map, which is a color map, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

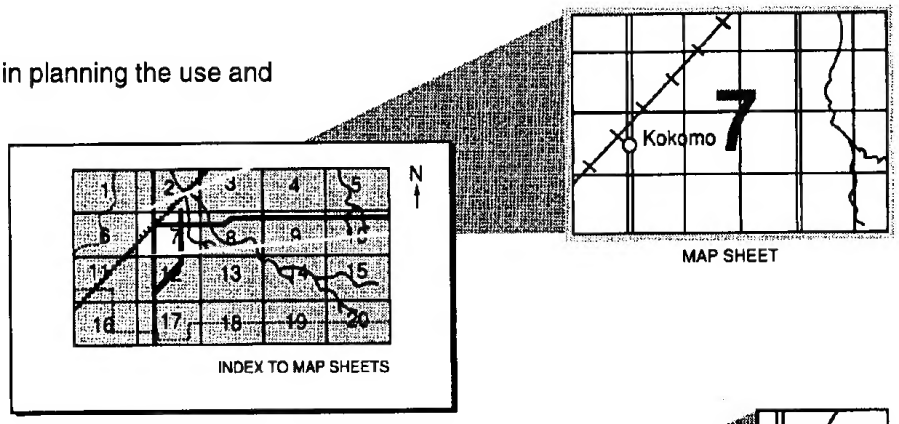
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1987-89. Soil names and descriptions were approved in 1992. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1989. This survey was made cooperatively by the Natural Resources Conservation Service, the University of Tennessee Agricultural Experiment Station, the Macon County Board of Commissioners, and the Tennessee Department of Agriculture. The survey is part of the technical assistance furnished to the Macon County Soil Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Typical landscape in the outer part of the Nashville Basin. Armour silt loam, 2 to 5 percent slopes, is in the valley. Mimosa soils are on hills. Hawthorne soils are on the highest peaks, which are known as the Highland Rim.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is http://www.nrcs.usda.gov (click on "Technical Resources").

Contents

Issued 2004

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights soil limitations, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations that affect various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

James Ford
State Conservationist
Natural Resources Conservation Service

Soil Survey of Macon County, Tennessee

By Carlie McCowan, Natural Resources Conservation Service

Soils surveyed by Carlie McCowan and David M. Tatum, Natural Resources Conservation Service, and Phillip G. Gregory and John G. Gibi, Macon County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
Tennessee Agricultural Experiment Station, Macon County Board of Commissioners, and the Tennessee Department of Agriculture

Macon County is in the north-central part of Tennessee (fig. 1). It is bounded on the east by Clay and Jackson Counties, on the south by Smith and Trousdale Counties, and on the west by Sumner County, Tennessee. It is bounded on the north by Allen and Monroe Counties, Kentucky.

Macon County has a land area of 196,500 acres, or about 307 square miles. Lafayette, the county seat, is located near the center of the county.

General Nature of the County

This section gives general information on settlement; natural resources; geology and physiography; and climate of Macon County.

Settlement

The area now called Macon County was once the hunting grounds of Cherokee, Chickasaw, and Creek Indians. The first settlers arrived between 1787 and 1800. Many had land grants from the States of Kentucky and North Carolina.

Macon County was established on January 18, 1842, from parts of Smith and Sumner Counties. It was named for Nathaniel Macon, who had served as Congressman and Senator from North Carolina. Lafayette, the county seat, was named for the French general, Marquis de Lafayette, who served in the Continental Army during the American Revolution (*3*).

The settlers engaged mainly in farming, raising corn, wheat, tobacco, and potatoes. They harvested the plentiful timber to produce lumber, rails, and many other useful items for the frontier farm.

The town of Red Boiling Springs, known for its mineral wells, became a resort in 1850.

Natural Resources

Soil, the most important resource in the county, is used in producing cultivated crops, hay crops, pastured livestock, timber products, and other marketable products. In most of the county water is adequate both for domestic use and watering livestock. Numerous farm ponds and many miles of streams provide water for livestock and recreation. Wells and springs provide potable water for most homes.

Physiography and Geology

Macon County is part of the Highland Rim and Nashville Basin Major Land Resource Areas. Steep and very steep hillsides separating undulating and rolling ridgetops make up most uplands in the county. The landscape is highly dissected and has many streams and drainageways. Narrow bottomlands are along streams.

The geology of the county has been mapped in detail in most areas. The Highland Rim consists of the Fort Payne Formation of Mississippian age. This formation consists of siltstone, shale, and crinoidal limestone. It weathers to form soils with common to many fragments of chert and gravel. Most of the wider ridgetops are covered with a silty layer of possibly

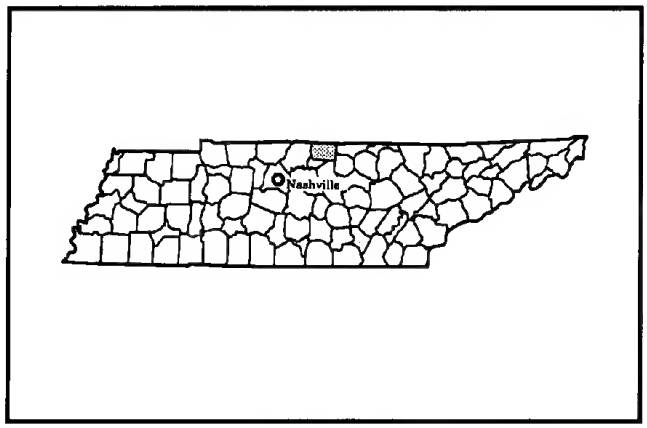


Figure 1.—Location of Macon County in Tennessee.

eolian origin. The lower elevations consist of the outer part of the Nashville Basin, which is of Ordovician age and has thin, discontinuous formations in the upper part of the Devonian- and Silurian-age material. The Nashville Basin is comprised of the Pegram Formation, the Wayne Group, Brassfield Limestone, the Sequatchie Formation, the Leipers and Catheys Formation, and Bigby-Cannon Limestone. These weather to form yellowish and brownish soils that have a high clay content. In many areas the bedrock is exposed at the surface (*8*).

Macon County is drained by many small creeks, the largest of which are Long Creek, Salt Lick Creek, Puncheon Creek, and Goose Creek. Most streams in Macon County flow north into the Barren River in Kentucky; the rest flow south into the Cumberland River. The highest elevation in the county is slightly over 1,080 feet, near Willette and Russell Hill. The lowest elevation is 510 feet, where the Middle Fork of Goose Creek leaves the county.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Lafayette, Tennessee, in the period 1955 to 1987. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 38 degrees F and the average daily minimum temperature is 27 degrees. The lowest temperature on record, which occurred on January 24, 1963, is -20 degrees. In summer, the average temperature is 75 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature, which occurred on July 20, 1986, is 102 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is about 54 inches. Of this, 27 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 23 inches. The heaviest 1-day rainfall during the period of record was 6.8 inches on June 23, 1969. Thunderstorms occur on about 54 days each year.

The average seasonal snowfall is about 12 inches. The greatest snow depth at any one time during the period of record was 9 inches. On the average, 2 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible in summer and 45 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 10 miles per hour, in spring.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and

miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept or model of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area do not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils or miscellaneous areas and some minor soils or miscellaneous areas. It is named for the major soils or miscellaneous areas. The components of one map unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

1. Sugargrove-Dickson

Gently sloping to moderately steep, deep and very deep, well drained and moderately well drained soils on moderately dissected uplands

This map unit consists of moderately broad to narrow ridgetops and moderately steep hillsides. It has a dendritic drainage pattern with numerous drainageways and narrow streams. The natural vegetation is oak-hickory forest.

This unit makes up about 24 percent of the county. It is about 64 percent Sugargrove soils, 10 percent Dickson soils, and 26 percent soils of minor extent.

Sugargrove soils are on rounded ridgetops and convex side slopes. They are sloping or moderately steep. They are deep, well drained gravelly soils underlain by highly weathered siltstone, limestone, and shale.

Dickson soils are on moderately broad ridgetops. They are gently sloping. They are very deep and moderately well drained and have a fragipan in the subsoil.

Of minor extent in this map unit are Sengtown, Sulphura, Mountview, and Hawthorne soils on uplands and Skidmore soils on bottom lands.

More than 50 percent of the soils in this unit have been cleared and are used mostly for pasture or hay. Only a small acreage is suited to row crops because of the severe erosion hazard. Most cleared acreage is well suited or moderately suited to hay and pasture.

The soils in this unit are well suited or moderately suited to woodland use. Oaks, hickories, yellow-poplar, and shortleaf and Virginia pines are some of the most common trees. Equipment use is limited on moderately steep slopes. Reforestation after harvesting must be carefully managed to reduce plant competition.

In most areas the soils in this unit are poorly suited to urban development because of slope. The soils on ridgetops are moderately suited to most uses. Dickson soils are poorly suited for use as sites for septic tank absorption fields because of slow permeability in the fragipan.

2. Mimosa-Hawthorne

Sloping to very steep, moderately deep and deep, well drained and somewhat excessively drained soils on deeply dissected uplands

This map unit consists of narrow ridgetops and moderately steep to very steep hillsides. It has a dendritic drainage pattern with numerous drainageways and narrow streams. Numerous drainageways dissect the hillsides to form a complex slope pattern. The natural vegetation is oak-hickory-eastern redcedar forest.

This unit makes up about 19 percent of the county. It is about 36 percent Mimosa soils, 35 percent Hawthorne soils, and 29 percent soils of minor extent.

Mimosa soils are on the lower part of hillsides and are sloping to steep. They are deep and well drained and have a slowly permeable, clay subsoil. These soils are underlain by hard limestone bedrock.

Hawthorne soils are on the upper part of hillsides

and on ridgetops. They are moderately steep to very steep. They are moderately deep, somewhat excessively drained, and have a loamy texture with many rock fragments throughout. These soils are underlain by highly weathered siltstone, limestone, and shale.

Of minor extent in this unit are Ashwood, Barfield, Dellrose, and Sulphura soils on uplands, Armour soils on footslopes and terraces, and Arrington and Ocana soils on bottom lands. Rock outcrops are commonly associated with Barfield and Ashwood soils.

In most areas the soils in this map unit are used as woodland. The cleared areas are used mostly for pasture and hay. The soils in this unit are poorly suited to row crops. They are moderately suited to pasture on slopes of 30 percent or less.

The soils in this unit are suited to woodland use. Ash, eastern redcedar, white oak, red oak, and chestnut oak are some of the most common trees. The steep slopes restrict use of logging equipment. Erosion is a hazard on logging roads and skid trails.

This unit is poorly suited to urban use because of steep slopes, moderately deep Hawthorne soils, slowly permeable Mimosa soils, and rock outcrops.

3. Dickson-Mountview-Bewleyville

Gently sloping and sloping, very deep, moderately well drained and well drained soils on broad ridges of uplands

The landscape is undulating and rolling and has low relief. Drainageways are not prominent features in this unit. Some streams drain into depressions or sinkholes with no surface outlet present. The natural vegetation is oak-hickory forest.

This unit makes up about 13 percent of the county. It is about 37 percent Dickson soils, 28 percent Mountview soils, 15 percent Bewleyville soils, and 20 percent soils of minor extent.

Dickson soils are on broad, smooth ridgetops and are gently sloping. They are very deep and moderately well drained. Permeability is slow in the fragipan in the subsoil.

Mountview soils are on higher lying parts of broad ridgetops and on moderately wide, convex ridgetops. They are gently sloping and sloping, very deep, and well drained.

Bewleyville soils are on higher lying parts of broad ridgetops and on undulating uplands. They are gently sloping and sloping, very deep, and well drained.

Of minor extent in this unit are Dewey, Sengtown, and Sugargrove soils on side slopes and Guthrie soils in slight depressions.

Most of this map unit is cleared and is used for row crops or pasture. It is well suited or moderately suited to row crops and well suited to pasture. Most row crops in the county are grown on this unit.

The soils in this unit are well suited to woodland use. White oak, red oak, hickory, and yellow-poplar are some of the most common trees. Reforestation after harvest must be carefully managed to reduce plant competition.

The soils are well suited or moderately suited to most urban uses. Dickson soils are poorly suited to use as sites for septic tank absorption fields because of the slowly permeable fragipan. On Dickson, Mountview, and Bewleyville soils, low strength is a limitation for roads and streets.

4. Hawthorne-Barfield

Moderately steep to very steep, shallow and moderately deep, well drained and somewhat excessively drained soils on deeply dissected uplands

This unit has high relief because streams and drainageways have cut deeply into the landscape. It has narrow ridgetops and long, steep and very steep hillsides. The natural vegetation is oak-hickory-eastern redcedar forest.

This unit makes up about 4 percent of the county. It is about 47 percent Hawthorne soils, 20 percent Barfield soils, and 33 percent soils of minor extent.

Hawthorne soils are on narrow ridgetops and on the upper part of hillsides. They are moderately steep to very steep. They are moderately deep and somewhat excessively drained and have many rock fragments throughout. These soils are underlain by highly weathered siltstone and limestone.

Barfield soils are on hillsides and are steep or very steep. They are shallow and well drained and have a clayey subsoil. They are underlain by hard limestone bedrock.

Of minor extent are Ashwood, Dellrose, Mimosa, and Sulphura soils on uplands and Skidmore soils on narrow bottom lands. Rock outcrops are commonly associated with Barfield and Ashwood soils.

In most areas the soils in this map unit are used as woodland. The cleared areas are used mostly for pasture. In the major part of this unit the soils are not suited to row crops and are poorly suited to pasture because of steep slopes and depth to bedrock.

Hawthorne and the soils of minor extent are moderately suited to woodland use. White oak, black oak, chestnut oak, hickory, and yellow-poplar are the most common trees. Steep slopes restrict the use of logging equipment and erosion is a hazard on

logging roads and skid trails. Barfield soils are poorly suited to woodland use. Shallow depth to bedrock, steep
slopes, and low available water capacity are limitations.

The soils in this unit are poorly suited to urban development because of steep slopes and depth to bedrock.

5. Hawthorne-Sugargrove-Sengtown

Sloping to very steep, moderately deep to very deep, well drained and somewhat excessively drained, gravelly soils on deeply dissected uplands

This unit consists of narrow, sloping ridgetops and steep and very steep hillsides. The wider ridgetops have moderately steep shoulder slopes. The relief is moderately high. Numerous short drainageways dissect the hillsides to form a complex slope pattern. The natural vegetation is oak-hickory forest.

This unit makes up about 40 percent of the county. It is about 47 percent Hawthorne soils, 21 percent Sugargrove soils, 13 percent Sengtown soils, and 19 percent soils of minor extent.

Hawthorne soils are on hillsides and are moderately steep to very steep. They are moderately deep, somewhat excessively drained soils that have many rock fragments throughout. These soils are underlain by highly weathered siltstone and limestone.

Sugargrove soils are on ridgetops and shoulder slopes and are sloping or moderately steep. These deep, well drained, gravelly soils are underlain by siltstone, limestone, and shale.

Sengtown soils are on ridgetops and shoulder slopes. They are sloping or moderately steep. They are very deep, well drained and have a clayey subsoil. They are underlain by limestone bedrock.

Of minor extent are Dellrose, Dickson, Mountview, and Sulphura soils on uplands, Humphreys soils on terraces, and Skidmore soils in drainageways and on bottom lands.

Pasture is the dominant land use on this map unit. Some ridgetops, terraces, and bottom lands are used for row crops and are moderately suited to this use. These soils are well suited or moderately suited to pasture on slopes up to about 30 percent. They are poorly suited to pasture on steeper slopes.

The soils in this unit are moderately suited to woodland use. Red oak, black oak, white oak, hickory, and yellow-poplar are the most common trees on this unit. Loblolly pine and shortleaf pine are some of the best suited trees for planting. Steep slopes restrict
use of logging equipment. Erosion is a hazard on logging roads and skid trails.

The soils in this unit are poorly suited to urban development because of steep slopes. Small areas on less sloping ridgetops, footslopes, and terraces are suitable for dwellings and other, less intensive uses.

Detailed Soil Map Units

The map units delineated on the detailed maps at the back of this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the heading "Use and Management of the Soils."

A map unit delineation on a map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils or miscellaneous areas. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils and miscellaneous areas are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some "included" areas that belong to other taxonomic classes.

Most included soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, inclusions. They may or may not be mentioned in the map unit description. Other included soils and miscellaneous areas, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, inclusions. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The included areas of contrasting soils or miscellaneous areas are mentioned in the map unit descriptions. A few included areas may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of included areas in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans, but if intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Mimosa silt loam, 5 to 12 percent slopes, eroded, is a phase of the Mimosa series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes, is an example.

This survey includes *miscellaneous areas.* Such areas have little or no soil material and support little or no vegetation. Pits, quarry, is an example.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Tables" in "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many terms used in describing the soils or miscellaneous areas.

Soil Descriptions

AmB—Armour silt loam, 2 to 5 percent slopes

This is a very deep, well drained, gently sloping soil on footslopes and low stream terraces. It is mostly in long, narrow areas along drainageways. Individual areas range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 21 inches, dark yellowish brown silt loam
21 to 36 inches, brown silt loam
36 to 60 inches, brown silty clay loam

Included with this soil in mapping are soils that contain more than 15 percent gravel and small areas of Arrington soils in drainageways. Also included are small areas of soils that have a lighter colored surface layer than that of the Armour soil and small areas of moderately well drained soils.

Important soil properties and features of this Armour soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops. A few areas are used for pasture or woodland.

This soil is well suited to row crops, hay, and pasture (fig. 2). It is suited to all crops and forage plants commonly grown in the county. Erosion is a moderate hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and use of cover crops.

This soil is well suited to woodland use. Black walnut, yellow-poplar, loblolly pine, and northern red oak are suited to planting on this soil. Reforestation after harvest must be carefully managed to reduce plant competition.

This soil is well suited to most urban uses. It has moderate limitations on sites for septic tank absorption fields and trench landfills, but these limitations are not difficult to overcome. This soil has severe limitations for local roads and streets because of low strength. This limitation can be overcome by using special construction for adequate support or by providing suitable subgrade or base material.

This soil is in capability subclass IIe.

AmC2—Armour silt loam, 5 to 12 percent slopes, eroded

This is a very deep, well drained, sloping soil on footslopes and low terraces. It is mostly in elongated areas along drainageways. Individual areas range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, brown silt loam

Subsoil:
9 to 21 inches, dark yellowish brown silt loam
21 to 36 inches, brown silt loam
36 to 60 inches, brown silty clay loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are soils that contain more than 15 percent gravel and small areas of Arrington soils in drainageways. Also included are small areas of soils that have a lighter colored surface layer than that of the Armour soil and small areas of moderately well drained soils.

Important soil properties and features of this Armour soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Figure 2.—Armour silt loam, 2 to 5 percent slopes, a prime farmland soil, is well suited to row crops. In the background, the pasture is on Dellrose soils and the woodland is on Mimosa soils.

Most of the acreage of this soil is used for row crops. A few areas are used as pasture or woodland.

This soil is moderately suited to row crops and well suited to pasture. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops. Farming on the contour, stripcropping, and forage crops in the crop rotation also help to control erosion.

This soil is well suited to woodland use. Black walnut, yellow-poplar, loblolly pine, and northern red oak are suitable for planting on this soil. Reforestation after harvest must be carefully managed to reduce plant competition.

This soil is well suited to most urban uses. It has moderate limitations for most urban uses because of slope and the clay content in the subsoil. However, these limitations are not difficult to overcome. This soil has severe limitations for local roads and streets because of low strength. This limitation can be overcome by using special construction for adequate support or by providing suitable subgrade or base material.

This soil is in capability subclass IIIe.

Ar—Arrington silt loam, occasionally flooded

This is a very deep, well drained, nearly level soil on flood plains of creeks and in drainageways. Slopes are 0 to 2 percent. Individual areas are long and narrow and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 24 inches, dark brown silt loam

Subsoil:
24 to 32 inches, dark yellowish brown silt loam
32 to 60 inches, dark brown silt loam

Included with this soil in mapping are small areas of soils that have more than 15 percent gravel. Also included are small areas of soils that have a clayey subsoil. Also included are areas of soils that have a dark surface layer less than 24 inches thick.

Important soil properties and features of this Arrington soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Slightly acid or neutral
Flood hazard: Occasional, very brief duration
High water table: Within 4 to 6 feet of the surface in late winter and early spring
Depth to bedrock: More than 60 inches

Most of the acreage of this soil has been cleared and is used for row crops, pasture, or hay.

This soil is well suited to row crops, pasture, and hay. It is suited to most crops and forage plants commonly grown in the county and high yields can be attained. Small grains may be damaged by flooding.

This soil is well suited to woodland use. Black walnut, yellow-poplar, and cherrybark oak are some species suitable for planting. Reforestation after harvesting must be carefully managed to reduce competition.

This soil is not suited to most urban uses because of the flood hazard. Flooding is a very difficult limitation to overcome.

This soil is in capability subclass IIw.

BaF—Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes

This map unit consists of Barfield and Ashwood soils and Rock outcrop in areas so intermixed they could not be separated in mapping. The Barfield soil generally makes up about 40 percent of the unit, Rock outcrop about 30 percent, and the Ashwood soil about 25 percent, but the content in each unit is variable. This unit is steep and very steep. It is on highly dissected hillsides. Individual areas range from 10 to more than 100 acres.

The typical sequence, depth, and composition of the layers of the Barfield soil are as follows—

Surface layer:
0 to 3 inches, very dark grayish brown silty clay loam

Subsoil:
3 to 7 inches, very dark grayish brown clay
7 to 16 inches, dark brown flaggy clay

Bedrock:
16 inches, hard limestone

Rock outcrop consists of limestone bedrock that extends from a few inches to 3 or 4 feet above the soil surface. In some areas limestone bedrock escarpments are up to 20 feet tall. They generally are in bands on the contour around the slope.

The typical sequence, depth, and composition of the layers of the Ashwood soil are as follows—

Surface layer:
0 to 5 inches, very dark grayish brown silty clay loam

Subsoil:
5 to 12 inches, dark brown silty clay loam
12 to 15 inches, dark yellowish brown clay
15 to 32 inches, light olive brown clay

Bedrock:
32 inches, hard limestone

Included in mapping are some small areas of Mimosa soils. Small areas of Dellrose soils are included on concave side slopes and benches. Also included are small areas that are more than 50 percent rock outcrop.

Important soil properties and features of the Barfield soil are—

Permeability: Moderately slow
Available water capacity: Low or very low
Soil reaction: Slightly acid to slightly alkaline
Flood hazard: None
Depth to bedrock: Less than 20 inches

Important soil properties and features of the Ashwood soil are—

Permeability: Moderately slow
Available water capacity: Low or moderate
Soil reaction: Slightly acid or neutral
Flood hazard: None
Depth to bedrock: 20 to 40 inches

Most of the acreage of this unit is used as woodland. In some areas the unit had been cleared, but because it is difficult to manage and has low forage potential, it is reverting again to woodland.

This map unit is not suited to row crops or pasture. Steep slopes, rock outcrops, and very low to moderate available water capacity are severe limitations to agricultural use.

This unit is poorly suited to commercial timber production. Steep slopes, rock outcrops, and very low to moderate available water capacity are severe limitations to growth and management of woodland. Eastern redcedar is suitable to plant on these soils. Loblolly pine can be planted on the deeper soils. Steep slopes cause an erosion hazard and an equipment limitation on this unit. Shallow depth and low available water capacity cause seedling mortality and a windthrow hazard for trees.

This map unit is not suited to most urban development. Rock outcrops, soil depth, steep slopes, and high shrink-swell potential are all very difficult limitations to overcome.

This map unit is in capability subclass VIIs.

BeB2—Bewleyville silt loam 2 to 5 percent slopes, eroded

This is a very deep, well drained, gently sloping soil. It is dominantly on broad ridgetops on uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 27 inches, strong brown silt loam
27 to 39 inches, yellowish red silty clay loam
39 to 60 inches, dark red silty clay loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping, at the heads of drainageways and in nearly level areas, are small areas of moderately well drained Dickson soils. Also included, on short, convex side slopes and nose slopes between drainageways, are small areas of severely eroded soils that have a reddish silty clay loam surface layer.

Important soil properties and features of this Bewleyville soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid or strongly acid in the upper part of the soil and strongly acid or very strongly acid in lower part
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops. The rest is used mostly for pasture.

This soil is well suited to row crops, hay, and pasture. It is suited to all crops and forage plants commonly grown in the county. Erosion is a moderate hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops.

This soil is well suited to woodland use. Black walnut, yellow-poplar, loblolly pine, and northern red oak are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is well suited or moderately suited to most urban uses. It has moderate limitations for some uses because of moderate permeability and the clay content of the subsoil, but these limitations are not difficult to overcome. This soil has severe limitations for local roads and streets because of low strength. This limitation can be overcome by using special construction for adequate support or by providing suitable subgrade or base material.

This soil is in capability subclass IIe.

BeC2—Bewleyville silt loam, 5 to 12 percent slopes, eroded

This is a very deep, well drained sloping soil. It is dominantly on broad, rolling, convex ridgetops. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, dark brown silt loam

Subsoil:
9 to 27 inches, strong brown silt loam
27 to 39 inches, yellowish red silty clay loam
39 to 60 inches, dark red silty clay loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping, at the heads of

drainageways and in nearly level areas, are small areas of moderately well drained Dickson soils. Also included, on short, convex side slopes and nose slopes between drainageways, are small areas of severely eroded soils that have a reddish silty clay loam surface layer.

Important soil properties and features of this Bewleyville soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid or strongly acid in the upper part of the soil and strongly acid or very strongly acid in lower part
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture.

This soil is moderately suited to row crops and well suited to pasture. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops. Farming on the contour, stripcropping, and use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Black walnut, yellow-poplar, loblolly pine, and northern red oak are suitable for planting on this soil. Skid trails and haul roads should be selected carefully because of a moderate erosion hazard. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is well suited or moderately suited to most urban uses. It has moderate limitations for most urban uses because of slope and the clay content of the subsoil, but these limitations are not difficult to overcome. This soil has severe limitations for local roads and streets because of low strength. This limitation can be overcome by using special construction for adequate support or by providing suitable subgrade or base material.

This soil is in capability subclass IIIe.

DaC—Dellrose gravelly silt loam, 5 to 12 percent slopes

This is a sloping, very deep, well drained soil on concave benches and footslopes. Individual areas of this soil are irregular in shape and range from 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 10 inches, dark brown gravelly silt loam

Subsoil:
10 to 40 inches, dark yellowish brown gravelly silt loam
40 to 60 inches, yellowish brown very gravelly silt loam

Included in mapping are a few small areas of soils that have more than 35 percent coarse fragments. Also included are a few small areas of Armour soils.

Important soil properties and features of this Dellrose soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture. A few areas are used as woodland.

This soil is moderately suited to row crops and well suited to pasture. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops.

This soil is well suited to woodland use. Productivity is high. Yellow-poplar, northern red oak, black walnut, white ash, and loblolly pine are suitable for planting on this soil. Undesirable plants prevent adequate natural or artificial reforestation without intensive site preparation and maintenance.

This soil is moderately suited to most urban uses. Slope is a moderate limitation for most uses. Chert fragments are a limitation for some uses. These limitations can generally be overcome by proper design of structures and facilities.

This soil is in capability subclass IIIe.

DaD2—Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded

This is a moderately steep, very deep, well drained soil on concave side slopes and benches. Individual areas are irregular in shape and range from 5 to 40 acres.

The typical sequence, depth, and composition of

the layers of this soil are as follows—

Surface layer:
0 to 7 inches, dark brown gravelly silt loam

Subsoil:
7 to 40 inches, dark yellowish brown gravelly silt loam
40 to 60 inches, yellowish brown very gravelly silt loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included in mapping are a few small areas of soils that have more than 35 percent coarse fragments. Also included are areas of soils that do not have a dark surface layer.

Important soil properties and features of this Dellrose soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for pasture or woodland. A few areas are used for row crops.

This soil is poorly suited to row crops because of moderately steep slopes and a very severe erosion hazard. If this soil is used for cultivated crops, minimum tillage and other conservation practices are needed to control erosion. The soil is moderately suited to hay and pasture.

This soil is well suited to woodland use. Productivity is high. Yellow-poplar, northern red oak, black walnut, white ash, and loblolly pine are suitable for planting on this soil. Erosion hazard and use of equipment are moderate management concerns during timber harvest because of moderately steep slopes. Undesirable plants prevent adequate natural or artificial reforestation without intensive site preparation and maintenance.

This soil is poorly suited to most urban uses because of moderately steep slopes. This limitation can be overcome for some uses, but slippage is a serious hazard when cuts are made in the lower part of slopes.

This soil is in capability subclass IVe.

DaE2—Dellrose gravelly silt loam, 20 to 30 percent slopes, eroded

This is a steep, very deep, well drained soil on concave side slopes. Individual areas are irregular in shape and range from 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 7 inches, dark brown gravelly silt loam

Subsoil:
7 to 40 inches, dark yellowish brown gravelly silt loam
40 to 60 inches, yellowish brown gravelly silt loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included in mapping are a few small areas of soils that have more than 35 percent chert fragments. Also included are areas of soils that do not have a dark surface layer.

Important soil properties and features of this Dellrose soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for woodland or pasture.

This soil is poorly suited to row crops and hay and is moderately suited to pasture because of steep slopes. Avoiding overgrazing helps to control erosion.

This soil is well suited to woodland use. Productivity is high. Yellow-poplar, red oak, black walnut, white ash, and loblolly pine are suitable for planting on this soil. Steep slopes are a limitation for equipment use. Erosion is a hazard on logging roads and skid trails. Undesirable plants prevent adequate natural or artificial reforestation without intensive site preparation and maintenance.

This soil is poorly suited to urban uses because of steep slopes. Slippage is a severe problem when cuts are made in the lower part of slopes.

This soil is in capability subclass VIe.

DeC2—Dewey silt loam, 5 to 12 percent slopes, eroded

This is a very deep, well drained, sloping soil on broad, rolling ridgetops. Individual areas are irregular in shape and range from 5 to 20 acres.

The typical sequence, depth, and composition of

the layers of this soil are as follows—

Surface layer:
0 to 8 inches, reddish brown silt loam

Subsoil:
8 to 14 inches, red silty clay loam
14 to 64 inches, red clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included in mapping are small areas of Bewleyville soils on the least sloping part of the landscape. Also included are small areas of Sengtown and Sugargrove soils.

Important soil properties and features of this Dewey soil are—

Permeability: Moderate:
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for pasture. Some areas are used for row crops, and other areas are used as woodland.

This soil is moderately suited to row crops and well suited to pasture. Slope, erosion hazard, and moderate available water capacity are the main limitations. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops. Farming on the contour and use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Yellow-poplar, black walnut, and loblolly pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is moderately suited to most urban uses. Slope, moderate shrink-swell potential, and a clayey subsoil are moderate limitations for several uses. These limitations can normally be overcome by using proper design of structures and facilities. Low strength is a severe limitation for roads and streets. This limitation can be overcome by adding coarse gravel to the subgrade.

This soil is in capability subclass IIIe.

DeD2—Dewey silt loam, 12 to 20 percent slopes, eroded

This is a very deep, well drained, moderately steep soil on convex side slopes on uplands. Individual areas are irregular in shape and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, reddish brown silt loam

Subsoil:
8 to 14 inches, red silty clay loam
14 to 64 inches, red clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small, irregular areas of Sengtown and Sugargrove soils.

Important soil properties and features of this Dewey soil are—

Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most acreage of this soil is used for pasture or woodland.

This soil is poorly suited to row crops and well suited to pasture. Erosion is a severe hazard if row crops are grown using conventional tillage. Good pasture management is needed to control erosion and to maintain productivity. Good management includes fertilization, weed control, and avoiding overgrazing.

This soil is well suited to woodland use. Yellow-poplar, black walnut, and loblolly pine are trees suitable for planting. Steepness of slope causes an erosion hazard during harvesting and reforestation. It also makes the operation of equipment more hazardous. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Moderately steep slopes, moderate shrink-swell potential, and a clayey subsoil are difficult limitations to overcome for most uses.

This soil is in capability subclass IVe.

DkB2—Dickson silt loam, 2 to 5 percent slopes, eroded

This is a very deep, moderately well drained, gently sloping soil. It has a fragipan in the subsoil. It is on broad ridgetops of dissected uplands. Individual areas are irregular in shape and range from 5 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark yellowish brown silt loam

Subsoil:
8 to 25 inches, yellowish brown silt loam
25 to 48 inches, yellowish brown silt loam fragipan
48 to 60 inches, red silty clay loam

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are a few small areas of Mountview soil. These areas are generally in narrow bands on shoulder slopes near the edge of the map unit. Also included are small areas of somewhat poorly drained soils in low areas.

Important soil properties and features of this Dickson soil are—

Permeability: Slow
Available water capacity: Moderate or high
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
High water table: 2 to 3 feet below the surface in late winter and early spring
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops. Some areas are used for hay and pasture.

This soil is well suited to row crops, hay, and pasture (fig. 3). Erosion is a moderate hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops.

This soil is well suited to woodland use. Yellow-poplar, loblolly pine, and shortleaf pine are suitable for planting on this soil. Large or isolated trees are subject to windthrow. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses.

Figure 3.—Dickson silt loam, 2 to 5 percent slopes, eroded, is well suited for hay and pasture.

Wetness and slow permeability are moderate or severe limitations for most uses. Some limitations may be reduced or overcome by proper design of structures and facilities.

This soil is in capability subclass IIe.

Gu—Guthrie silt loam, ponded

This is a very deep, nearly level, poorly drained soil. It has a compact fragipan in the subsoil. This soil is in depressions on broad upland flats. Individual areas are irregular in shape and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 4 inches, dark grayish brown silt loam

Subsurface layer:
4 to 12 inches, light brownish gray silt loam

Subsoil:
12 to 27 inches, light brownish gray silt loam
27 to 60 inches, gray silt loam fragipan

Included in mapping are a few small areas of somewhat poorly drained soils. Also included are small areas of poorly drained soils that do not have a fragipan.

Important soil properties and features of this Guthrie soil are—

Permeability: Slow
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None; water ponded 1 to 2 feet on the surface, in winter and spring
High water table: From 0 to 1 foot below the surface in winter and spring
Depth to bedrock: More than 60 inches

Most acreage of this soil is used as woodland. A few areas are in pasture.

This soil is poorly suited to row crops because of wetness and ponding during the growing season. It is moderately suited to pasture if such water-tolerant plants as tall fescue and white clover are grown.

This soil is moderately suited to water-tolerant tree species. Sweetgum, willow oak, and American sycamore are suitable for planting on this soil. Equipment use is limited to dry months in summer and fall because of excessive wetness. Reforestation is difficult. Seedling mortality is high because of ponding. Large or isolated trees are subject to windthrow because the fragipan restricts rooting depth. Undesirable plants prevent adequate natural or artificial reforestation without intensive site preparation and maintenance.

This soil is not suited to urban development because of a high water table and ponding. Slow permeability and low strength are also limitations.

This soil is in capability subclass Vw.

HaD—Hawthorne gravelly silt loam, 12 to 25 percent slopes

This is a moderately deep, moderately steep, somewhat excessively drained soil on side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 10 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 1 inch, dark grayish brown gravelly silt loam

Subsurface layer:
1 to 7 inches, yellowish brown gravelly silt loam

Subsoil:
7 to 25 inches, yellowish brown very channery silt loam

Substratum:
25 to 60 inches, soft, highly weathered, fractured siltstone and limestone

Included in mapping are a few small areas of Sugargrove soils on ridgetops and upper side slopes, and small areas of soils that have less than 35 percent fragments in the subsoil. Also included, on concave side slopes, are small areas of Dellrose soils. Small areas of soils that are underlain by hard bedrock within a depth of 40 inches are included also.

Important soil properties and features of this Hawthorne soil are—

Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Strongly acid to extremely acid
Flood hazard: None
Depth to bedrock: 20 to 40 inches

Most of the acreage of this soil is used for woodland. A few areas are used for pasture.

This soil is not suited to row crops and is poorly suited to pasture. Moderately steep slopes, depth to soft bedrock, a large amount of rock fragments in the soil, and low available water capacity are the main limitations.

This soil is moderately suited to woodland use. Trees suitable for planting include loblolly pine and shortleaf pine. Erosion is a hazard on skid trails and roads. Equipment use is limited by moderately steep slopes. Seedling survival is lowered by lack of adequate moisture in the soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to urban development because of moderately steep slopes and depth to bedrock. The large amount of rock fragments in this soil is also a limitation.

This soil is in capability subclass VIs.

HaF—Hawthorne gravelly silt loam, 25 to 55 percent slopes

This is a moderately deep, steep and very steep, somewhat excessively drained soil on side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 10 to 200 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 1 inch; dark grayish brown gravelly silt loam

Subsurface layer:
1 to 7 inches, yellowish brown gravelly silt loam

Subsoil:
7 to 25 inches, yellowish brown very channery silt loam

Substratum:
25 to 60 inches, soft, highly weathered siltstone and limestone

Included with this soil in mapping are a few small areas of Sugargrove soils on ridgetops and upper side slopes; and small areas of Dellrose soils on concave side slopes. Also included are a few small areas of soils that are underlain by hard bedrock at a depth of 40 inches or less, and on the lower part of slopes, are small areas of limestone outcrops, including bluffs, up to 20 feet high.

Important soil properties and features of this Hawthorne soil are—

Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Strongly acid to extremely acid
Flood hazard: None
Depth to bedrock: 20 to 40 inches

Most of the acreage of this soil is used for woodland (fig. 4).

This soil is not suited to row crops and is poorly suited to pasture. Moderately steep slopes, depth to soft bedrock, the large amount of rock fragments in

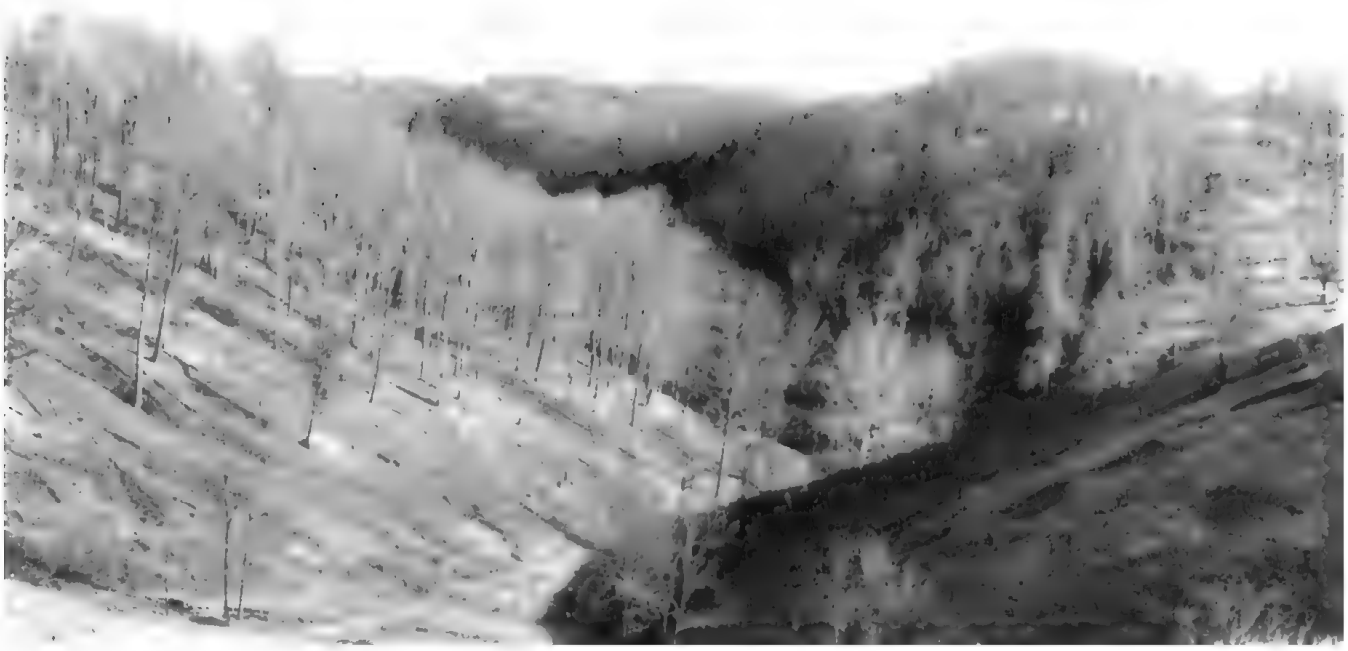


Figure 4.—Hawthorne gravelly silt loam, 25 to 55 percent slopes, is used mostly as woodland. The shadow in the lower right corner is from an adjacent hill.

the soil, and low available water capacity are the most limiting features.

This soil is moderately suited to woodland use. Trees suitable for planting include loblolly pine and shortleaf pine. Equipment use is restricted because of steep slopes. Erosion is a hazard on skid trails and roads. Seedling survival is lowered by a lack of adequate moisture in the soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to urban development because of steep slopes and depth to bedrock.

This soil is in capability subclass VIIs.

HuB—Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded

This is a very deep, well drained soil on stream terraces, footslopes, and fans. Individual areas are normally long and narrow and at the base of dissected hills. They range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark brown gravelly silt loam

Subsoil:
8 to 15 inches, dark yellowish brown gravelly silt loam
15 to 50 inches, yellowish brown gravelly silt loam

Substratum:
50 to 60 inches, yellowish brown gravelly silt loam

Included in mapping are a few small areas of Skidmore soils and, near drainageways, are small areas of soils that are subject to occasional flooding. Also included are a few areas of soils that have a light colored surface layer.

Important soil properties and features of this Humphreys soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, but in limed areas the surface layer is less acid
Flood hazard: Rare, very brief duration
High water table: Within 5 to 6 feet of the surface in late winter and early spring
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture (fig. 5).

This soil is well suited to row crops and pasture. Erosion is a moderate hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and use of cover crops including grasses and legumes.

This soil is well suited to woodland use. Yellow-poplar, black walnut, cherrybark oak, and loblolly pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suitable for dwellings because of the flood hazard. If protected from flooding, it can be used for most urban uses.

This soil is in capability subclass IIe.

HuC—Humphreys gravelly silt loam, 5 to 12 percent slopes

This is a very deep, well drained gravelly soil on stream terraces, footslopes, and fans. Areas of this soil are mostly long and narrow and are at the base of dissected hills. They range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark brown gravelly silt loam

Subsoil:
8 to 15 inches, dark yellowish brown gravelly silt loam
15 to 50 inches, yellowish brown gravelly silt loam

Substratum:
50 to 60 inches, yellowish brown gravelly silt loam

Included with this soil in mapping are a few small areas of Skidmore soils, and small areas of soils that have less than 15 percent rock fragments. Also included are a few areas of soils that have a lighter colored surface layer.

Important soil properties and features of this Humphreys soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Very strongly acid to moderately acid, but in limed areas the surface layer is less acid
Flood hazard: None
High water table: Within 5 to 6 feet of the surface in late winter and early spring
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is in row crops or pasture.

This soil is moderately suited to row crops and well

Figure 5.—Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded, is commonly used to grow tobacco. The stubble is from the harvested crop.

suited to pasture. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and use of cover crops including grasses and legumes. Farming on the contour and including forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Yellow-poplar, black walnut, and loblolly pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is moderately suited to urban uses. Slope is a moderate limitation for most uses. Slope can be overcome by designing structures to fit the landscape.

This soil is in capability subclass IIIe.

Le—Lee gravelly silt loam, occasionally flooded

This is a very deep, poorly drained, loamy soil on flood plains. Slopes are 0 to 2 percent. Individual areas are long and narrow and range from 5 to 15 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, dark grayish brown gravelly silt loam

Subsoil:
8 to 38 inches, light brownish gray and gray gravelly silt loam

Substratum:
38 to 60 inches, gray gravelly silt loam

Included with this soil in mapping are small areas of soils that have less than 15 or more than 35 percent chert within a depth of 36 inches. Also included are small areas of soils that are ponded for extended periods and areas of somewhat poorly drained soils.

Important soil properties and features of this Lee soil are—

Permeability: Moderate

Available water capacity: Moderate
Soil reaction: Very strongly acid or strongly acid, but in limed areas the surface layer is less acid
Flood hazard: Occasional, very brief duration
High water table: Within 0.5 to 1 foot of the surface in late winter and early spring
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for pasture. The rest is used as woodland.

This soil is moderately suited to such short-season row crops as soybeans and poorly suited to other row crops. Wetness and flooding are the main limitations. This soil is moderately suited to hay and pasture. Water-tolerant plants, such as tall fescue and white clover, are best suited. Restricting grazing during wet periods helps to reduce soil compaction.

This soil is moderately suited to woodland use. Sweetgum, yellow-poplar, and American sycamore are suitable for planting. Equipment use is restricted during wet periods. Surface water from flooding and the high water table reduce survival rates of tree seedlings. Undesirable plants reduce adequate natural or artificial reforestation. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to most urban uses because of flooding and wetness.

This soil is in capability subclass IIIw.

Ln—Lindside silt loam, occasionally flooded

This is a very deep, moderately well drained, loamy soil on narrow to moderately wide flood plains. Slopes are 0 to 2 percent. Individual areas are long and narrow and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, brown silt loam

Subsoil:
8 to 15 inches, yellowish brown silt loam
15 to 25 inches, yellowish brown silt loam that has grayish mottles
25 to 40 inches, light brownish gray silt loam

Substratum:
40 to 60 inches, light brownish gray gravelly silt loam

Included with this soil in mapping are small areas of soils that have more than 15 percent gravel throughout. Also included are small areas of somewhat poorly drained soils.

Important properties and features of this Lindside soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, very brief to brief duration
High water table: Within 1.5 to 3 feet of the surface in late winter and early spring for very brief or brief duration
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is cleared and is used for row crops or pasture. A few areas are used as woodland.

This soil is well suited to most row crops. Tobacco should not be planted in low-lying areas because of flooding and wetness. This soil is well suited to pasture and hay. Alfalfa is only moderately suited because of the seasonal high water table.

This soil is well suited to woodland use. Black walnut, yellow-poplar, cherrybark oak, and loblolly pine are suitable for planting on this soil. Undesirable plants prevent adequate natural or artificial reforestation without intensive site preparation and maintenance.

This soil is not suited to most urban uses because of flooding. Seasonal wetness and low strength are also limitations.

This soil is in capability subclass IIw.

MmC2—Mimosa silt loam, 5 to 12 percent slopes, eroded

This is a deep, well drained, sloping soil that has a clayey subsoil. It is on convex ridgetops on highly dissected uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark brown silt loam

Subsoil:
6 to 16 inches, brown clay
16 to 56 inches, yellowish brown clay

Bedrock:
56 inches, hard limestone

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included in mapping are small areas of soils that

are less than 40 inches deep to bedrock. Also included are small areas of Armour soils and a few small areas of rock outcrops.

Important soil properties and features of this Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline.
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used for pasture. The rest is woodland.

This soil is poorly suited to row crops and moderately suited to hay and pasture. A heavy clay subsoil and moderate available water capacity are the main limitations. Erosion is a severe hazard if row crops are grown using conventional tillage. Pasture plants, such as tall fescue, are best suited.

This soil is moderately suited to woodland use. Loblolly pine, black locust, and eastern redcedar are suitable for planting on this soil. Reforestation after harvest must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Slow permeability, low strength, depth to bedrock, and moderate shrink-swell potential are difficult limitations to overcome.

This soil is in capability subclass IVe.

MmD2—Mimosa silt loam, 12 to 20 percent slopes, eroded

This is a deep, well drained, moderately steep soil that has a clayey subsoil. It is on side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark brown silt loam

Subsoil:
6 to 16 inches, brown clay
16 to 56 inches, yellowish brown clay

Bedrock:
56 inches, hard limestone

The surface layer consists of topsoil and subsoil that has been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small areas of soils that are less than 40 inches deep to bedrock. Also included are small areas of Dellrose soils and small areas of rock outcrops.

Important soil properties and features of this Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline.
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used for pasture. The rest is used as woodland.

This soil is poorly suited to row crops and moderately suited to hay and pasture. A heavy clay subsoil, slope, and moderate available water capacity are the main limitations. Erosion is a very severe hazard if cultivated crops are grown. Pasture plants, such as tall fescue, are best suited.

This soil is moderately suited to woodland use. Loblolly pine, black locust, and eastern redcedar are suitable for planting on this soil. Skid trails and haul roads need to be laid out carefully to reduce the hazard of erosion. Slope is a moderate limitation to the use of equipment. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Slope, slow permeability, low strength, depth to bedrock, and moderate shrink-swell potential are difficult limitations to overcome.

This soil is in capability subclass VIe.

MmD3—Mimosa silty clay, 8 to 20 percent slopes, severely eroded

This is a deep, well drained, sloping and moderately steep, clayey soil. It is on side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, dark yellowish brown silty clay

Subsoil:
3 to 38 inches, yellowish brown clay
38 to 47 inches, light olive brown clay

Substratum:
47 to 50 inches, light yellowish brown clay

Bedrock:
50 inches, hard limestone

The surface layer is mostly subsoil material because erosion has removed most or all of the original surface layer.

Included in mapping are small areas of soils that are less than 40 inches deep to bedrock. Also included are a few small areas of rock outcrops and a few areas of gullied soils.

Important soil properties and features of this Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline.
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used for pasture. Some areas have grown up in bushes and are reverting to woodland.

This soil is poorly suited to row crops, hay, and pasture. A clayey surface layer and subsoil, slope, and moderate available water capacity are the main limitations. Seedbed preparation is difficult and seed germination is poor because of the clayey plow layer. Pasture plants, such as tall fescue, are best suited.

This soil is moderately suited to woodland use. Loblolly pine, black locust, and eastern redcedar are suitable for planting on this soil. Erosion is a hazard on logging roads and skid trails. Equipment use is limited by moderately steep slopes. Seedling survival is lowered by the lack of adequate moisture in the soil in summer. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Slope, slow permeability, low strength, depth to bedrock, and moderate shrink-swell potential are difficult limitations to overcome.

This soil is in capability subclass VIe.

MmE2—Mimosa silt loam, 20 to 35 percent slopes, eroded

This is a deep, well drained, steep soil that has a clayey subsoil. It is on side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark brown silt loam

Subsoil:
6 to 16 inches, brown clay
16 to 56 inches, yellowish brown clay

Bedrock:
56 inches, hard limestone

Included with this soil in mapping are small areas of soils that are less than 40 inches deep to bedrock. Also included are small areas of Dellrose soils and a few small areas of rock outcrop.

Important soil properties and features of this Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used for pasture. The rest is used as woodland.

This soil is not suited to row crops because of steep slopes and very severe erosion hazard. It is poorly suited to pasture and hay. Pastures are difficult to maintain on steep slopes. Only pasture plants, such as tall fescue, are suited to this soil.

This soil is moderately suited to woodland use. Loblolly pine, black locust, and eastern redcedar are suitable for planting on this soil. Equipment use is limited on steep slopes, and erosion is a hazard on logging roads and skid trails. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to most urban uses because steep slopes are a severe limitation. Slow permeability,

low strength, depth to bedrock, and moderate shrink-swell potential are also difficult limitations to overcome.

This soil is in capability subclass VIe.

MoD2—Mimosa silt loam, 5 to 20 percent slopes, eroded, very rocky

This is a deep, well drained, sloping and moderately steep soil. It has a clayey subsoil. It is on side slopes and ridgetops of highly dissected uplands. Limestone outcrops cover 2 to 10 percent of the surface. Individual areas of this soil are irregular in shape and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 6 inches, dark brown silt loam

Subsoil:
6 to 16 inches, brown clay
16 to 56 inches, yellowish brown clay

Bedrock:
56 inches, hard limestone

Included with this soil in mapping are small areas of soils that are less than 40 inches deep to bedrock. Also included are small areas of Dellrose soils.

Important soil properties and features of this Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline.
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used for pasture. The rest is used as woodland.

This soil is not suited to row crops because of the large number of rock outcrops. Moderate available water capacity and the heavy clay subsoil are also limitations. This soil is poorly suited to hay and moderately suited to pasture. Pasture plants, such as tall fescue, are best suited.

This soil is moderately suited to woodland use. Loblolly pine, black locust, and eastern redcedar are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Rock outcrops, slope, low strength, and moderate shrink-swell potential are difficult limitations to overcome.

This soil is in capability subclass VIs.

MrE—Mimosa-Rock outcrop complex, 20 to 45 percent slopes

This map unit consists of the Mimosa soil and areas of Rock outcrop in areas so intermixed they could not be separated in mapping. The Mimosa soil makes up about 60 percent of the unit and Rock outcrop makes up about 30 percent, but the content of each is variable. This unit is on steep side slopes of highly dissected uplands. Individual areas are irregular in shape and range from 10 to 150 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, brown silt loam

Subsoil:
3 to 6 inches, dark yellowish brown silty clay loam
6 to 20 inches, dark yellowish brown clay
20 to 42 inches, mottled yellowish brown and dark yellowish brown clay

Bedrock:
42 inches, hard, limestone

Rock outcrop consists of limestone bedrock that extends from a few inches to about 3 feet above the surface of the soil. It generally is in bands on the contour of the slope.

Included in mapping are some small areas of Barfield, Ashwood, and Armour soils. Also included are small areas where rock outcrops cover more than 50 percent of the surface. Also included are small areas of severely eroded soils that have a clayey surface layer and a few gullies 1 to 2 feet deep.

Important soil properties and features of the Mimosa soil are—

Permeability: Slow
Available water capacity: Moderate
Soil reaction: Moderately acid or strongly acid, but in limed areas the surface layer is less acid. The layer just above bedrock is moderately acid to slightly alkaline.
Flood hazard: None
Depth to bedrock: 40 to 60 inches

Most of the acreage of this soil is used as woodland. A few areas are used as pasture.

This map unit is not suited to row crops and is poorly suited to pasture. It is difficult to establish and maintain for pasture because of steep slopes and the large number of rock outcrops (fig. 6). Erosion is a very severe hazard if vegetation is removed.

This unit is poorly suited to commercial timber production. Loblolly pine and eastern redcedar are suitable for planting on this soil. Steep slopes and rock outcrops limit use of equipment and increase the hazard of using equipment. Skid trails and haul roads need to be selected carefully because of erosion hazard. Reforestation after harvesting must be carefully managed to reduce plant competition.

This map unit is poorly suited to most urban uses. Steep slopes, the large number of rock outcrops, low strength, and slow permeability are very difficult limitations to overcome for most urban uses.

The Mimosa soil is in capability subclass VIIs.

MtB2—Mountview silt loam, 2 to 5 percent slopes, eroded

This is a very deep, well drained, gently sloping soil on ridgetops on uplands. Individual areas are irregular in shape and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 24 inches, yellowish brown silt loam
24 to 35 inches, yellowish brown silty clay loam

Figure 6.—Mimosa-Rock outcrop complex, 20 to 45 percent slopes, is difficult to manage for pasture. This unit is commonly invaded by eastern redcedar, and much of it is reverting to woodland.

35 to 40 inches, red gravelly silty clay
40 to 60 inches, red gravelly clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small areas of Dickson, Bewleyville, and Sugargrove soils. Dickson soils are in saddles, Bewleyville soils are in level areas, and Sugargrove soils are in narrow bands on shoulder slopes of steeper hillsides.

Important soil properties and features of this Mountview soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture.

This soil is well suited to row crops, hay, and pasture. Erosion is a moderate hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and use of cover crops. Farming on the contour, stripcropping, and use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Yellow-poplar, black walnut, southern red oak, and loblolly pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is well suited to most urban uses. It has moderate limitations for some uses, but most of these are not difficult to overcome. This soil has severe limitations for local roads and streets because of low strength. This limitation can be overcome by adding additional material to the subgrade.

This soil is in capability subclass IIe.

MtC2—Mountview silt loam, 5 to 12 percent slopes, eroded

This is a very deep, well drained, sloping soil on side slopes and convex ridgetops. Individual areas are irregular in shape and range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, dark yellowish brown silt loam

Subsoil:
9 to 24 inches, yellowish brown silt loam
24 to 35 inches, yellowish brown silty clay loam
35 to 40 inches, red gravelly silty clay
40 to 60 inches, red gravelly clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small areas of Bewleyville and Sugargrove soils. Bewleyville soils are in level areas. Sugargrove soils are in narrow bands on shoulder slopes of steeper hillsides.

Important soil properties and features of this Mountview soil are—

Permeability: Moderate
Available water capacity: High
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture.

This soil is moderately suited to most row crops and well suited to hay and pasture. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and use of cover crops. Farming on the contour, stripcropping, and use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Yellow-poplar, black walnut, southern red oak, and loblolly pine are suitable for planting on this soil. Skid trails and haul roads should be selected carefully because of a moderate erosion hazard. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is well suited or moderately suited to most urban uses. Slope and clay content in the subsoil are moderate limitations for most urban uses. These limitations are not difficult to overcome. Low strength is a severe limitation for local roads and streets. This limitation can be overcome by adding additional material to the subgrade.

This soil is in capability subclass IIIe.

Oc—Ocana gravelly silt loam, occasionally flooded

This is a very deep, well drained soil on narrow flood plains. Slopes are 0 to 3 percent. Individual areas are normally long and narrow and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 8 inches, brown gravelly silt loam

Subsoil:
8 to 38 inches, brown and dark yellowish brown gravelly silt loam

Substratum:
38 to 60 inches, brown very gravelly silt loam

Included with this soil in mapping are small areas of Skidmore soils. Also included, on footslopes along narrow drainageways, are small areas of Armour and Humphreys soils.

Important soil properties and features of this Ocana soil are—

Permeability: Moderately rapid
Available water capacity: Moderate
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, very brief duration
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for row crops or pasture. A few areas are used as woodland.

This soil is moderately suited to row crops and well suited to hay and pasture. Gravel in the surface layer and the subsoil can hinder tillage and reduce the available water capacity. In some years flooding during the growing season can damage crops.

This soil is well suited to woodland use. Yellow-poplar, cherrybark oak, black walnut, and loblolly pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to most urban uses because of the flood hazard.

This soil is in capability subclass IIs.

Pt—Pits, quarry

This unit consists of areas that are currently used as limestone quarries or were previously used as limestone quarries. Limestone is crushed for use in building materials or is ground into agricultural lime. The areas consist of pits and adjacent rock walls. Areas around the pits are used to store crushed stone, soil overburden, and undesirable rock.

This unit is not suited to farming, woodland use, or urban development.

This unit has not been assigned to a capability class.

SeC2—Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded

This is a very deep, well drained, sloping soil on ridgetops on uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown gravelly silt loam

Subsoil:
5 to 14 inches, strong brown gravelly silty clay loam
14 to 60 inches, red gravelly clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small areas of Bewleyville and Mountview soils.

Important soil properties and features of this Sengtown soil are—

Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for pasture. A few areas are used for row crops or as woodland.

This soil is moderately suited to row crops and is well suited to hay and pasture. The gravel in the surface layer hinders tillage and reduces the available water capacity. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops. Farming on the contour, stripcropping, and the use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Yellow-

poplar, loblolly pine, and shortleaf pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is moderately suited to most urban uses. It has moderate or severe limitations for most uses, but special design and proper installation help to overcome the limitations.

This soil is in capability subclass IIIe.

SeD2—Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded

This is a very deep, well drained, moderately steep soil on side slopes on uplands. Individual areas are irregular in shape and range from 5 to 25 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 5 inches, dark yellowish brown gravelly silt loam

Subsoil:
5 to 14 inches, strong brown gravelly silty clay loam
14 to 60 inches, red gravelly clay

The surface layer consists of topsoil and subsoil that have been mixed by tillage. About 50 percent of the original surface layer has been removed by erosion.

Included with this soil in mapping are small areas of Sugargrove soils and a few small areas of Mountview soils.

Important soil properties and features of this Sengtown soil are—

Permeability: Moderate
Available water capacity: Moderate
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: More than 60 inches

Most of the acreage of this soil is used for pasture. A few areas are used as woodland.

This soil is poorly suited to row crops because slope limits the use of equipment, erosion is a very severe hazard, and yields are low. It is moderately suited to hay and pasture. The gravel in the surface layer hinders seedbed preparation and reduces the available water capacity. Good pasture management is needed to control erosion and to maintain productivity. It includes fertilization, weed control, and avoiding overgrazing.

This soil is well suited to woodland use. Yellow-poplar, loblolly pine, and shortleaf pine are suitable for planting on this soil. Skid trails and haul roads need to be selected carefully because of a moderate erosion hazard. Slope makes the operation of equipment more hazardous. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses. Moderately steep slopes are a severe limitation for most uses. This limitation can be partly overcome by special design. The clayey subsoil and low strength are also limitations for some uses.

This soil is in capability subclass IVe.

Sk—Skidmore gravelly loam, occasionally flooded

This is a deep, well drained soil on narrow flood plains adjacent to steep hills. Slope is 0 to 3 percent. Individual areas are mostly long and narrow and range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 9 inches, brown gravelly loam

Subsoil:
9 to 39 inches, dark yellowish brown very gravelly loam

Substratum:
39 to 50 inches, dark yellowish brown very gravelly loam
50 to 54 inches, pale brown extremely gravelly loam
54 to 60 inches, soft weathered black shale

Included with this soil in mapping are small areas of Ocana soils. Also included are small areas of Humphreys soils on footslopes adjacent to drainageways.

Important soil properties and features of this Skidmore soil are—

Permeability: Moderately rapid
Available water capacity: Low
Soil reaction: Moderately acid to neutral
Flood hazard: Occasional, very brief duration
High water table: Within 4 to 6 feet of the surface in late winter and early spring
Depth to bedrock: 50 to 60 inches or more

Most of the acreage of this soil is used for pasture. A few areas are used for row crops or as woodland.

This soil is moderately suited to row crops and well suited to hay and pasture. The high content of gravel in the surface layer and the subsoil interferes with tillage,

reduces the available water capacity, and lowers yields.

This soil is well suited to woodland use. Yellow-poplar, American sycamore, cherrybark oak, black walnut, and loblolly pine are suitable for planting on this soil. Seedling survival is reduced by the low available water capacity and the flood hazard. Planting more seedlings than normal ensures a good stand. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to most urban uses because of flooding. A seasonal high water table and the quantity of gravel in the soil are also limitations for some uses.

This soil is in capability subclass IIIs.

SrC2—Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded

This is a deep, well drained, sloping soil on narrow, convex ridgetops on highly dissected uplands. Individual areas range from 5 to 75 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 7 inches, dark yellowish brown gravelly silt loam

Subsoil:
7 to 13 inches, yellowish brown gravelly silt loam
13 to 31 inches, brown gravelly silty clay loam
31 to 50 inches, yellowish red very gravelly silty clay

Substratum:
50 to 62 inches, highly weathered siltstone and limestone

Included with this soil in mapping are small areas of Mountview and Sengtown soils. Also included are small areas of soils less than 60 inches deep to hard bedrock.

Important soil properties and features of this Sugargrove soil are—

Permeability: Moderate
Available water capacity: Moderate or high
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: 40 to 60 inches to weathered bedrock and more than 60 inches to hard bedrock

Most of the acreage of this soil is used for hay or pasture (fig. 7). A few areas are used for row crops or as woodland.

This soil is only moderately suited to row crops and is well suited to hay and pasture. Rock fragments in this soil interfere with tillage and reduce the available water capacity. Erosion is a severe hazard when row crops are grown using conventional tillage. A resource management system is needed to help to

Figure 7.—Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded, is on narrow, convex ridgetops. In most areas it is used for hay or pasture. A few small areas are in corn.

control erosion and to conserve moisture. It should include crop residue management, minimum tillage, and the use of cover crops. Farming on the contour, stripcropping, and the use of forage crops in the cropping system also help to control erosion.

This soil is well suited to woodland use. Loblolly pine, Virginia pine, and shortleaf pine are suitable for planting on this soil. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is moderately suited to most urban uses because of slope and depth to bedrock. Special design and proper installation help to overcome these limitations.

This soil is in capability subclass IIIe.

SrD2—Sugargrove gravelly silt loam, 12 to 20 percent slopes, eroded

This is a deep, well drained, moderately steep soil on side slopes of highly dissected uplands. Individual areas range from 10 to 200 acres.

The typical sequence, depth, and composition of the layers of the Sugargrove soil are as follows—

Surface layer:
0 to 7 inches, dark yellowish brown gravelly silt loam

Subsoil:
7 to 13 inches, yellowish brown gravelly silt loam
13 to 31 inches, brown gravelly silty clay loam
31 to 50 inches, yellowish red very gravelly silty clay

Substratum:
50 to 62 inches, highly weathered siltstone and limestone

Included with this soil in mapping are small areas of Sengtown and Hawthorne soils. Also included are small areas of soils less than 60 inches deep to hard bedrock.

Important soil properties and features of this Sugargrove soil are—

Permeability: Moderate
Available water capacity: Moderate or high
Soil reaction: Strongly acid or very strongly acid, but in limed areas the surface layer is less acid
Flood hazard: None
Depth to bedrock: 40 to 60 inches to weathered bedrock and more than 60 inches deep over hard bedrock

Most of the acreage of this soil is used for pasture. Some areas are used as woodland. A few areas are used for row crops.

This soil is poorly suited to row crops and is moderately suited to hay and pasture. Rock fragments in this soil interfere with tillage and reduce the available water capacity. Erosion is a very severe hazard if row crops are grown using conventional tillage. Moderately steep slopes are a limitation to use of equipment. Good pasture management is needed to control erosion and to maintain productivity. It includes fertilization, weed control, and avoiding overgrazing.

This soil is well suited to woodland use. Loblolly pine, shortleaf pine, and Virginia pine are suitable for planting on this soil. Skid trails and haul roads need to be selected carefully because of the moderate erosion hazard. Slope makes the operation of equipment more hazardous. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is poorly suited to most urban uses because of slope, depth to bedrock, and rock fragments in the soil. Special design and proper installation help to overcome these limitations.

This soil is in capability subclass IVe.

SuF—Sulphura channery silt loam, 25 to 65 percent slopes

This is a steep and very steep, moderately deep, somewhat excessively drained soil. It is on side slopes on highly dissected uplands. Individual areas range from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
0 to 3 inches, brown channery silt loam

Subsurface layer:
3 to 9 inches, brown channery silt loam

Subsoil:
9 to 22 inches, yellowish brown very channery silt loam

Substratum:
22 to 28 inches, soft shale interlayered with thin seams of brownish soil material

Bedrock:
28 inches, hard shale

Included with this soil in mapping are small areas of soils that are less than 20 inches deep to bedrock, and areas of rock outcrops where windthrown trees and

soil slippage have exposed the bedrock. Also included are a few rock bluffs along the larger drainageways, and small areas of Hawthorne and Sugargrove soils on the upper parts of slopes.

Important soil properties and features of this Sulphura soil are—

Permeability: Moderate
Available water capacity: Low
Soil reaction: Strongly acid or moderately acid
Flood hazard: None
Depth to bedrock: 20 to 40 inches

Most of the acreage of this soil is used as woodland. A few acres have been cleared and are used for pasture.

This soil is not suited to row crops and is poorly suited to pasture because of steep or very steep slopes and low available water capacity.

This soil is poorly suited to woodland use. Loblolly pine, shortleaf pine, Virginia pine, and eastern redcedar are suitable for planting on this soil. Steep and very steep slopes cause a severe erosion hazard during timber harvest and limit the type of equipment that can be used. Soil slippage is a hazard in road cuts. Seedling mortality is a moderate limitation because of low available water capacity. Trees are subject to windthrow because of a moderately deep root zone. Reforestation after harvesting must be carefully managed to reduce plant competition.

This soil is not suited to urban development because of steep slopes and depth to bedrock.

This soil is in capability subclass VIIe.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. The slope ranges mainly from 0 to 5 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 30,719 acres in the survey area, or nearly 15.6 percent of the total acreage, meets the soil requirements for prime farmland.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps at the back of this publication. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

This section suggests general management needed for crops and pasture. It lists the estimated yields of the main crops and pasture plants for each soil. It also describes the system of land capability classification used by the Natural Resources Conservation Service.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Pasture and hay are the major land uses of cleared land in Macon County. The acreage of row crops has decreased in recent years and is relatively small in comparison, but these crops are still an important source of income. Tobacco, the main cash crop, was valued at about $5.4 million in 1987. Other major crops are corn, soybeans, and wheat. The acreage of vegetables and small fruits is gradually increasing.

In most areas the soils in the county are better suited to pasture than to row crops. The soils are too sloping for intensive row cropping. Crop yields can be increased by applying the latest crop production technology to all cropland in the county. This soil survey can help facilitate the application of such technology.

In addition to the commonly grown crops, the county has a potential for producing more vegetable crops, small fruits, tree fruits, and nursery stock. Deep, well drained soils that warm early in spring are well suited to vegetable and small fruit production. These soils include Mountview and Bewleyville soils on uplands and Armour, Humphreys, Ocana, and Arrington soils on terraces and bottom lands.

Most deep, well drained soils that are not steep are suited to orchards and nursery stock. Soils in low areas with poor drainage and frequent frost are poorly suited to orchards and vegetables. The latest information on growing field crops and horticultural crops can be obtained from local offices of the Cooperative Extension Service and the Natural Resources Conservation Service.

Soil erosion is the most important management problem in Macon County because of the large acreage of erodible soils. On slopes of more than about 2 percent, erosion is a hazard when crops are grown using conventional tillage.

Soil loss through erosion is damaging for a number of reasons. Productivity is reduced as the surface layer is removed and part of the subsoil is incorporated into the plow layer. Soil loss is especially damaging on Dickson soils, which have a fragipan, and Mimosa soils, which have a plastic, clayey subsoil. As erosion removes more soil, the root zone above the fragipan or clayey subsoil becomes thinner. During years of moisture stress, this thinning of the root zone reduces available water capacity and yields. Loss of the surface layer, which has a higher content of organic matter, also results in puddling and crusting. Most plant nutrients in the soil are in the surface layer, and can easily be lost by erosion. Controlling erosion reduces the pollution of streams by sediment and fertilizer and improves the quality of water for recreation, fish, and wildlife.

A resource management system that provides a protective surface cover, reduces runoff, and increases infiltration can help to hold erosion losses to acceptable amounts. On livestock farms, grasses and legumes help to reduce runoff, to control erosion, and to improve soil tilth. Legumes take nitrogen from the air and thus reduce the amount of nitrogen fertilizer needed.

Conservation tillage is one way to control erosion on sloping cropland. It provides more protective surface cover for longer periods, reduces runoff, and increases infiltration. It also increases the amount of organic material added to the soil, causes less soil compaction, and saves time and fuel. Contour farming, crop residue management, field borders, grasses and legumes in the cropping system, and grassed waterways are also helpful in holding erosion to an acceptable rate.

Most of the soils used for cultivated crops in the survey area have a surface layer of silt loam. Intense rainfall causes a crust to form on the surface of soils that have low organic matter content. The crust is hard when dry, reduces infiltration, and increases runoff. Regular additions and incorporation of crop residue, manure, or other organic material improve soil structure and reduce crusting.

Many soils in the county are strongly acid or very strongly acid in their natural state. Applications of agricultural limestone are required to raise the pH level sufficiently for good growth of most crops. Most soils also respond well to additions of commercial fertilizer.

Additions of lime and fertilizer should be based on the results of soil tests and on the needs for a desired yield level of a crop. The Cooperative Extension Service operates a soil testing laboratory. It provides test results and recommendations for the amount of plant nutrients and lime to apply.

Pasture and hayland make up a significant part of the county. The main grasses are tall fescue and orchardgrass. The most common legumes are white clover, red clover, ladino clover, alfalfa, annual lespedeza, and sericea lespedeza. Legumes should be included as part of the seed mixture for establishing pasture. They should be reintroduced in perennial grass stands when they thin out.

The major management practices needed on pastures are fertilization, weed control, rotational grazing, and occasional renovation. Fertilizer should be applied according to plant needs as indicated by plant growth, the level of production desired, and the results of soil tests. Weeds can be controlled in pastures by use of herbicides and by mowing before the weeds mature and produce seed. Well managed pastures that have a good stand of grasses and legumes contain fewer weeds.

Some annual grasses and legumes are used for supplemental grazing or for hay. Millet and soybeans are planted together and cut for hay. A sorghum-grass mixture, pearl millet, and sudangrass make good summer pasture and can also be used for hay. Small grains and annual ryegrass provide good grazing in late fall and early spring. Most hay harvested is the surplus growth of grass-legume pastures. Hay crops should be cut at the stage of growth that provides the best quality feed and does not damage the grass-legume stand. Hay cut late, after seed heads are mature, is less palatable and lower in protein content. The extra poundage that is gained by cutting late does not offset the lowering of the nutritional value of the hay. Cutting perennial hay crops too close causes premature loss of the stand.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage;

control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (*4*). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use. They have not been identified in Macon County.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production. They have not been identified in Macon County.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-4 and IIIe-6.

The capability classification of the map units in this survey area is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Woodland takes in 77,000 acres, or 39 percent of the land area of Macon County. All woodland is privately owned. The county was entirely forested when the first settlers arrived. Gradually, most of the county was cleared for cropping. As the highly productive forest soils eroded away from steep hills, the abandoned land grew up in grasses and trees.

In general, the forest of today occupies the steeper slopes and dry ridges that are poorly suited to crops and pasture. The timber species composition that

make up the bulk of woodland have changed little over the last 200 years. They still consist mostly of white oak, red oak, black oak, yellow-poplar, beech, maple, sweetgum, black gum, and hickory. Some scattered, nearly pure stands of eastern redcedar are generally associated with areas of shallow soils overlying limestone bedrock.

Two-thirds of the woodland grows on moderately productive soils with the potential to produce 425-600 board feet of lumber per acre per year. One-fourth of woodland is capable of growing 600-825 board feet per acre per year. The rest has relatively low timber production potential. Other uses of forest land include wildlife habitat, recreation, aesthetics, and conservation of soil, water, and air resources.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

In the table, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough for adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

Plant competition ratings indicate the degree to which undesirable species are expected to invade and grow when openings are made in the tree canopy. The main factors that affect plant competition are depth to the water table and the available water capacity. A rating of *slight* indicates that competition from undesirable plants is not likely to prevent natural regeneration or suppress the more desirable species. Planted seedlings can become established without undue competition. A rating of *moderate* indicates that competition may delay the establishment of desirable species. Competition may hamper stand development, but it will not prevent the eventual development of fully stocked stands. A rating of *severe* indicates that competition can be expected to prevent regeneration unless precautionary measures are applied.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity* number. The site index is the

average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

The species that is followed by an asterisk under *common trees* is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Recreation

The soils of Macon county generally are suitable for such recreation uses as picnic and playground areas, golf courses, and sports areas, campgrounds, hunting areas, and vacation farms. Streams formed from runoff and ground water from these soils support good warm water fishing and a limited amount of cold water fishing. Among the natural, scenic, and historic areas of the county are the Winding Stairs scenic area, the Red Boiling Springs rest and historic area, the Peddlers Ridge scenic area, and the Gravley Hill scenic and wilderness area.

The county's soil, climate, scenery, and water quality collectively offer good recreation development potential. Soils should present no major problem if careful consideration is given to soil depth, permeability, slope, texture, and drainage in relationship to the intended use.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In the table, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in the table can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have

moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Michael E. Zeman, biologist, Natural Resources Conservation Service, helped to prepare this section.

Macon County lies almost entirely within the Highland Rim and Pennyroyal Major Land Resource Areas. These land resource areas are rolling to steep and have narrow bottomlands. The climax plant community consists of hardwoods, dominantly such oaks as white oak, southern red oak, and post oak, and shagbark hickory, pignut hickory, yellow-poplar, and various other hardwoods. A small area on the southern edge of the county along the Trousdale County line lies within the Nashville Basin Major Land Resource Area. This land resource area is hilly and steep. The climax plant community consists of hardwoods, including eastern redcedar, hackberry, and osage orange.

Wildlife, an important natural resource, provides a number of values. It is a source of revenue from sport hunting and recreation, including hunting, photography, birdwatching, and aesthetics. The popular game species include bobwhite quail, whitetailed deer, cottontail, mourning dove, and gray and fox squirrels.

Bobwhite quail are scattered throughout the county. They are in higher concentrations in the western half. There, cropland is better distributed and is adjacent to cover areas of brushy fence rows, field borders, and random areas. Rabbit populations, which are good throughout the county, are highest in the southern part of the county. This area, which runs along the Nashville Basin, provides the best habitat. It comprises farmland mixed with dense brushy areas. The middle part of Tennessee, including Macon County, typically has more cottontail habitat than other parts of the State. In fall, doves migrate in greater numbers in the western part of the county, where abundant corn and wheat crops increase their food supply. Fox and gray squirrel populations are fair across the county. Gray squirrel, which is associated with larger hardwood forests, is most numerous in the eastern part of the county. Fox squirrel is typically associated with smaller woodlots and wooded fence rows throughout the county. The squirrel population is relatively stable.

Whitetailed deer is the most popular game animal in the county. Deer and wild turkey populations have recovered because of restoration activities of the Tennessee Wildlife Resources Agency and effective game management. Although deer were almost nonexistent in the 1940's, there is now, on average, one deer for about every 40 acres in the county. Deer are more concentrated along the southern edge of the county, where brush, such as honeysuckle thickets, provides excellent winter cover and food.

The wild turkey population declined to zero in the county in 1952. As of 1989, however, it has been reestablished, although not in sufficient numbers for hunting. However, the deer and turkey populations continue to increase in the county.

Nongame species in the county are in relative abundance, depending on the type and quality of habitat of individual species. Generally, management of habitat for game species improves that for most nongame species. Common nongame species include furbearers, songbirds, birds of prey, mammals, reptiles, and amphibians. Common furbearers include red and gray fox, raccoon, coyote, opossum, skunk, and weasel. Some common songbirds are cardinal, bluejay, Eastern bluebird, various woodpeckers, and warblers. Common birds of prey include barred owl, screech owl, and redtailed hawk. Several species of snakes inhabit the county, including garter snake, black rat snake, and the venemous copperhead snake. Other reptiles that inhabit the county include Eastern box turtle, red-ear turtle, and five-lined skink. Common mammals include Hispid cotton rat, voles, and moles. Common amphibians include bullfrogs and salamanders.

Currently, Federal endangered or threatened species have not been listed in Macon County. However, the Tennessee Wildlife Resources Agency lists the following: splendid darter, teardrop darter, orangefin darter, and blackfin darter. These relatively rare fish inhabit the tributaries of the Barren River system in the county. These tributaries run along the northern edge of the county and drain into the Barren River in Kentucky. The blackfin sucker also inhabits Long and Salt Lick Creeks.

On most soils in the county, seepage caused by the gravelly soil texture or excessive slope are moderate or severe limitations as sites for ponds. Nevertheless, the clayey subsoil has allowed building many ponds in the county for watering livestock and for recreational fishing. Recreational fishponds generally have channel catfish, largemouth bass, bluegill, redear sunfish, and

fathead minnow. They also have other warm water species, including bullhead catfish, green sunfish, longear sunfish, and various species of minnows. The water quality in fishponds is typically acidic and reduces fish production. Bass ponds that are limed, fertilized, and managed will produce 300-400 pounds of bass per acre. Most ponds that are not managed will produce 50-100 pounds per acre. The potential for warm water aquaculture in earthen ponds is very low because of soil limitations and topography. The potential for cold water aquaculture is also very low. The county has no commercial aquaculture enterprises.

Macon County has a total of 117 miles of warm water streams, which provide about 564 acres of aquatic habitat. Streams in the northern part of the county drain into the Barren River system of Kentucky. Streams in the southern part of the county are part of the Cumberland River drainage system. Overall, water quality is good. The Tennessee Department of Health and Environment has not listed any designated aquatic use restrictions. In general, streams in the county are moderately productive. Some of the more popular sportfish include largemouth bass, smallmouth bass, rock bass, bluegill sunfish, longear sunfish, and several species of catfish.

The county has very few wetlands. Most are on Guthrie and Lee soils, which are poorly drained and are subject to ponding or occasional flooding, respectively. Water oak, willow oak, sweetgum, yellow-poplar, and black willow are typical trees on wooded wetlands. The soils in wetlands have the potential to provide some of the most productive wildlife habitat in the county. The wintering waterfowl population is low because the county lies outside any major migratory flyway. However, other wildlife species inhabit wooded wetlands on a continuous basis.

Wildlife habitat is managed to provide adequate amounts of food, needed cover types, and water within the home range of wildlife. Lack of any one of these needs, an unfavorable balance among them, or an inadequate distribution of them can limit the numbers or account for the absence of an animal. For example, food for whitetailed deer includes fruit, acorns, leaves, twigs, weeds, and seeds. In Macon County the typical woodland habitat type provides several of these foods on a seasonal basis, but quality food possibly is not available on a regular, year-round basis. Creating openings to increase edge habitat adds to the food supply. Planting linear food plots supplements seasonal food shortages. In woodland habitat in Macon County, cover is not be a problem for deer. However, without openings, various other cover types, such as nesting cover and shrubby winter and escape cover, may be lacking for turkey and quail. The desired cover plants may need to be established.

Conservation practices support quality wildlife habitat. On cropland, planned crop rotations and crop residue management can provide food and needed winter cover for many species of songbirds, quail, dove, turkey, rabbit, and deer. Deferred grazing and fencing livestock can protect food plots, browse plants for deer, nesting cover in woodland and pasture, and even fish habitat. Filter strips along streams bordering cropland or pasture can protect water quality of streams and provide food, cover, and travel lanes for wildlife. Field borders of shrub or tall grass on improved pasture are beneficial to quail, deer, turkey, rabbit, and many nongame species. Selective thinning of woodland while protecting den and quality, mast-producing trees help to improve wildlife habitat. Other conservation practices that improve wildlife habitat include upland wildlife habitat management, wetland wildlife habitat management, fishpond management, grasses and legumes in rotation, nutrient management, pasture and hayland planting, pasture and hayland management, ponds, strip disking, tree planting, livestock exclusion, and woodland improvement.

Management practices harmful to wildlife are indiscriminate burning, chemical herbicides and insecticides, and heavy grazing. They also include complete, clean mowing early in the growing season, clean fall plowing, clearcutting extensive timberland, draining wetlands, and removing den and mast-producing trees.

Technical assistance in the planning or application of these wildlife management practices can be obtained from the Natural Resources Conservation Service, the University of Tennessee Agricultural Extension Service, the Tennessee Wildlife Resources Agency, and the Tennessee Division of Forestry.

The plant diversity in any given area of the county is determined by environmental factors such as soils, rainfall distribution, and management. Soil types determine plant adaptability and inherent productivity. Management determines the quality of the habitat. The plant diversity in turn determines the animal diversity found in any given area. In general, the more diverse the soil types and plant communities, the higher the biodiversity of the area.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water.

Wildlife habitat can be created or improved by planting appropriate vegetation, maintaining the existing plant cover, or promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

Elements of wildlife habitat

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, millet, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are orchardgrass, lovegrass, timothy, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, asters, and partridge pea.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are sumac, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, arrowhead, wildrye, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

Habitat for various kinds of wildlife

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, mourning dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild

turkey, barred owls, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and coyote.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of

the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and shrinking and swelling can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, and the available water capacity in the upper 40 inches affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. Unsaturated soil material beneath the absorption field is needed to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, and large stones.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, and soil reaction affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a

high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; and susceptibility to flooding. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of water erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, low fertility, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Rock fragments 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on

laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate
of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on the basis of measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, more than 9 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation

(USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.64. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on observations of the water table at selected sites and on the evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. Indicated in the table are the

depth to the seasonal high water table; the kind of water table—that is perched or apparent, and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in the table.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*5*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquept (*Aque*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquepts (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisols that have a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle size, mineral content, soil temperature regime, soil depth, and reaction. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, siliceous, acid, thermic Typic Haplquepts.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. An example is the Lee series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (*6*). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (*5*) and in "Keys to Soil Taxonomy" (*7*). Unless otherwise indicated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Armour Series

The Armour series consists of very deep, well drained soils. Permeability is moderate. These soils are on footslopes and low stream terraces in the outer part of the Nashville Basin. Slopes range from 2 to 12 percent.

Armour soils are near Arrington, Ocana, and Mimosa soils. Arrington soils, on adjacent flood plains, do not have an argillic horizon. Ocana soils, on

adjacent flood plains, do not have an argillic horizon and have more than 15 percent coarse fragments in the control section. Mimosa soils, on adjacent, higher lying uplands, have a clayey control section.

Typical pedon of Armour silt loam, 2 to 5 percent slopes (fig. 8); 1,000 feet east of limestone quarry in Hillsdale:

Ap—0 to 9 inches; dark yellowish brown (10YR 3/4) silt loam; moderate medium granular structure; friable; common fine and very fine roots; strongly acid; clear smooth boundary.

Bt1—9 to 21 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium and coarse subangular blocky structure; friable; common fine roots; common fine and medium pores; few faint clay films on faces of peds and in pores; few fine manganese concretions; few wormcasts; strongly acid; gradual smooth boundary.

Bt2—21 to 36 inches; brown (7.5YR 4/4) silt loam; common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; common distinct clay films on faces of peds and in pores; common fine manganese concretions; strongly acid; gradual smooth boundary.

Bt3—36 to 60 inches; brown (7.5YR 4/4) silty clay loam; few medium distinct dark yellowish brown (10YR 4/4) mottles and few medium distinct pale brown (10YR 6/3) silt coatings; moderate medium subangular blocky structure; friable; few fine roots; few fine pores; common distinct clay films on faces of peds and in pores; common manganese concretions; strongly acid.

The solum ranges from 42 to more than 60 inches in thickness. Depth to bedrock is more than 60 inches. Content of gravel ranges from 0 to 10 percent in the A and B horizons and from 0 to 35 percent in the C horizon. Reaction is moderately acid or strongly acid, but in limed areas the surface layer is less acid.

The A horizon has hue of 10YR, value of 3, and chroma of 3 or 4. Texture is silt loam.

The BA horizon, where it occurs, has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it has mottles in shades of brown and yellow. Texture is silt loam or silty clay loam.

The C horizon, where it occurs, has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In most pedons it has mottles in shades of brown, yellow, or red.

Arrington Series

The Arrington series consists of very deep, well drained soils. Permeability is moderate. These soils formed in loamy alluvium on flood plains in the outer part of the Nashville Basin. Slopes are 0 to 2 percent.

Arrington soils are near Armour and Mimosa soils. Armour soils, on adjacent stream terraces and footslopes, have an argillic horizon. Mimosa soils, on adjacent uplands, have an argillic horizon and a clayey control section.

Typical pedon of Arrington silt loam, occasionally flooded; 200 yards west of Highway 10 on Fords Branch Road; 100 feet north into field:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam; moderate medium granular structure; friable; many fine and very fine roots; neutral; clear smooth boundary.

A—8 to 24 inches; dark brown (10YR 3/3) silt loam; moderate medium granular structure; friable; common fine roots; neutral; gradual smooth boundary.

Bw1—24 to 32 inches; dark yellow brown (10YR 3/4) silt loam; weak medium subangular blocky structure; friable; common fine roots; few fine and medium pores; neutral; gradual smooth boundary.

Bw2—32 to 60 inches; dark brown (10YR 3/3) silt loam; moderate medium subangular blocky structure; friable; few fine roots; few fine and medium pores; neutral.

The solum ranges from 40 to more than 60 inches in thickness. Depth to bedrock is more than 60 inches. Reaction is slightly acid or neutral. Content of gravel is 0 to 5 percent in the solum and 0 to 15 percent in the C horizon.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Texture is silt loam.

The Bw horizon has hue of 10YR, value and chroma of 3 or 4. Texture is silt loam.

The C horizon, where it occurs, has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is silt loam.

Ashwood Series

The Ashwood series consists of moderately deep, well drained soils. Permeability is moderately slow. These soils have a clayey subsoil. They formed in residuum derived from limestone on side slopes on uplands in the outer part of the Nashville Basin. Slopes range from 20 to 70 percent.

Ashwood soils are near Barfield, Mimosa, Hawthorne, and Dellrose soils. Barfield soils, on adjacent side slopes, are less than 20 inches deep to

bedrock and do not have an argillic horizon. Mimosa soils, on lower side slopes, are deep and do not have a mollic epipedon. Hawthorne soils, on higher lying side slopes, are loamy, have more than 35 percent coarse fragments throughout, and are underlain by soft bedrock. Dellrose soils, on adjacent concave slopes, are very deep and have a fine-loamy control section.

Typical pedon of Ashwood silty clay loam, in an area of Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes; 1.5 miles east of Green Grove Community on Stony Road; north 1,500 feet on graveled road; west 1,000 feet up the hollow; north 200 feet:

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silty clay loam; moderate medium granular structure; friable; common fine and medium and few large roots; 10 percent limestone channers as much as 6 inches across; slightly acid; clear smooth boundary.

BA—5 to 12 inches; dark brown (10YR 3/3) silty clay loam; moderate medium subangular blocky structure; firm; common fine and medium and few coarse roots; 10 percent limestone channers up to 6 inches across; slightly acid; gradual smooth boundary.

Bt1—12 to 15 inches; dark yellowish brown (10YR 4/4) clay; strong medium angular blocky structure; firm; few fine and medium roots; common distinct clay films on faces of peds; common pressure faces on faces of peds; common manganese concretions; 10 percent limestone channers and flagstones up to 10 inches across; neutral; gradual smooth boundary.

Bt2—15 to 26 inches; light olive brown (2.5Y 5/4) clay; strong fine and medium angular blocky structure; firm; few roots; common distinct clay films on faces of peds; common pressure faces on faces of peds; common manganese concretions; 10 percent limestone channers and flagstones up to 10 inches across; neutral; gradual smooth boundary.

Bt3—26 to 32 inches; light olive brown (2.5YR 5/6) clay; common medium distinct dark yellowish brown (10YR 4/4) mottles; strong fine and medium angular blocky structure; firm; common distinct clay films on faces of peds; common pressure faces on faces of peds; common manganese concretions; 10 percent limestone channers and flagstones up to 10 inches across; neutral.

R—32 inches; hard limestone bedrock.

Solum thickness and depth to bedrock range from 25 to 40 inches. Reaction is slightly acid or neutral. The mollic epipedon ranges from 10 to 14 inches in thickness. Content of limestone channers and flagstones ranges to 15 percent.

The A and BA horizons have hue of 10YR, value of and chroma of 2 or 3. Texture is silty clay loam or silty clay.

The Bt horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. It is mottled in shades of brown or gray in the lower part of most pedons. Texture is silty clay or clay.

The BC horizon, where it occurs, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 4 or 6. It has few to many mottles in shades of brown and gray. Texture is silty clay or clay.

Barfield Series

The Barfield series consists of shallow, well drained soils. Permeability is moderately slow. These soils have a clayey subsoil. They formed in residuum derived from limestone on side slopes on uplands in the outer part of the Nashville Basin. Slopes range from 20 to 70 percent.

Barfield soils are near Ashwood, Mimosa, Hawthorne, and Dellrose soils. Ashwood soils, on adjacent side slopes, are 20 to 40 inches deep to bedrock and have an argillic horizon. Mimosa soils, on lower side slopes, have an argillic horizon and are 40 to 60 inches deep to bedrock. Hawthorne soils, on higher lying side slopes and ridgetops, have more than 35 percent gravel throughout and are 20 to 40 inches deep to rippable bedrock. Dellrose soils, on adjacent, concave slopes, are more than 60 inches deep and have a fine-loamy control section.

Typical pedon of Barfield silty clay loam, in an area of Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes; 6 miles south of Lafayette on Highway 10; north 2.3 miles on Carter Branch Road; west 500 feet into woods:

Oi—1 inch to 0; partly decomposed leaf litter.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silty clay loam; strong fine granular structure; friable; many fine and medium roots; many fine and medium pores; 14 percent thin limestone fragments; slightly acid; abrupt smooth boundary.

Bw1—3 to 7 inches; very dark grayish brown (10YR 3/2) clay; strong fine and medium subangular blocky structure; firm; common fine to coarse roots; 14 percent thin limestone fragments up to 2 feet across; slightly acid; gradual smooth boundary.

Bw2—7 to 16 inches; dark brown (10YR 3/3) flaggy clay; strong medium and coarse subangular

blocky structure; firm; common fine to coarse roots; 20 percent thin limestone fragments up to 2 feet across; neutral.
R—16 inches; fractured, limestone bedrock.

Solum thickness and depth to limestone bedrock range from 8 to 20 inches. Reaction ranges from slightly acid to slightly alkaline. Thickness of the mollic epipedon ranges from 7 to 16 inches. Content of thin limestone fragments ranges to less than 15 percent in the A horizon and to 25 percent in the B horizon.

The A horizon has hue of 10YR, value and chroma of 2 or 3. Texture is silty clay loam.

The Bw horizon has hue of 10YR, value and chroma of 2 or 3, but in some pedons it has both value and chroma of 4 in the lower part. Texture of the fine earth fraction is silty clay loam, silty clay, or clay.

The BC and C horizons, where they occur, have hue of 2.5Y or 10YR, value of 4 or 5, and chroma of 3 to 6. They have few to many mottles in shades of brown, olive, and yellow. Texture of the fine earth fraction is silty clay or clay.

The R layer is hard limestone bedrock.

Bewleyville Series

The Bewleyville series consists of very deep, well drained soils. Permeability is moderate. These soils formed in a mantle of loess 2 to 3.5 feet thick and in the underlying residuum derived from limestone or old alluvium. They are on broad ridgetops on uplands on the Highland Rim. Slopes range from 2 to 5 percent.

Bewleyville soils are near Dickson, Mountview, Dewey, and Sengtown soils. Dickson soils are moderately well drained, are on adjacent landscapes, and have a fragipan at a depth of about 24 inches. Mountview soils do not have hue of 5YR in the Bt horizon and have more fragments in the 2Bt horizon. Dewey soils, on adjacent side slopes, have a clayey subsoil. Sengtown soils, on adjacent side slopes, have a clayey subsoil and more than 15 percent chert gravel throughout.

Typical pedon of Bewleyville silt loam, 2 to 5 percent slopes, eroded (fig. 9); 1 mile west of Lafayette on Highway 52 bypass; 500 feet south of road:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium granular structure; friable; common fine and very fine and few coarse roots; common wormcasts; slightly acid; clear smooth boundary.
Bt1—9 to 27 inches; strong brown (7.5YR 4/6) silt loam; moderate medium subangular blocky structure; friable; common very fine and few medium roots; common fine and medium pores; few faint clay films on faces of peds; few manganese concretions; common wormcasts; moderately acid; gradual smooth boundary.
Bt2—27 to 39 inches; yellowish red (5YR 4/6) silty clay loam; moderate medium subangular blocky structure; firm; common fine roots; common fine and medium pores; common distinct clay films on faces of peds; common manganese concretions; strongly acid; gradual smooth boundary.
2Bt3—39 to 60 inches; dark red (2.5YR 3/6) silty clay loam; strong fine and medium subangular blocky structure; firm; many prominent dark red (10R 3/6) clay films on faces of peds and in pores; strongly acid.

Solum thickness and depth to limestone bedrock are more than 60 inches. Fragments of gravel are less than 5 percent in the A and Bt horizons and less than 15 percent in the 2Bt horizon. Reaction is moderately acid or strongly acid in the A and Bt horizons and strongly acid in the 2Bt horizon.

The Ap horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 5YR or 2.5YR, value of 3 to 5, and chroma of 4 or 6. Texture is silty clay loam, silty clay, or clay.

Dellrose Series

The Dellrose series consists of very deep, well drained soils. Permeability is moderately rapid. These soils formed in colluvium weathered from cherty limestone. They are on concave side slopes and benches below the base of the Highland Rim escarpment. Slopes range from 5 to 30 percent.

Dellrose soils are near Hawthorne, Barfield, and Mimosa soils. Hawthorne soils, on higher lying side slopes, have more than 35 percent coarse fragments throughout and are less than 40 inches thick in the solum. Barfield soils, on adjacent, higher lying side slopes, are less than 20 inches deep to bedrock and have a clayey control section. Mimosa soils, on adjacent and lower lying side slopes, have a higher base saturation and a clayey subsoil.

Typical pedon of Dellrose gravelly silt loam, 20 to 30 percent slopes, eroded; 3 miles east of Meadorville on Dry Fork Road, south 0.3 mile on paved road; 20 feet east of road:

Oi—1 inch to 0; partly decomposed leaf litter.
A—0 to 7 inches; dark brown (10YR 3/3) gravelly silt

Figure 8.—Typical pedon of Armour soils. These medium textured, well drained soils are on stream terraces. They have very few rock fragments to a depth of more than 4 feet.

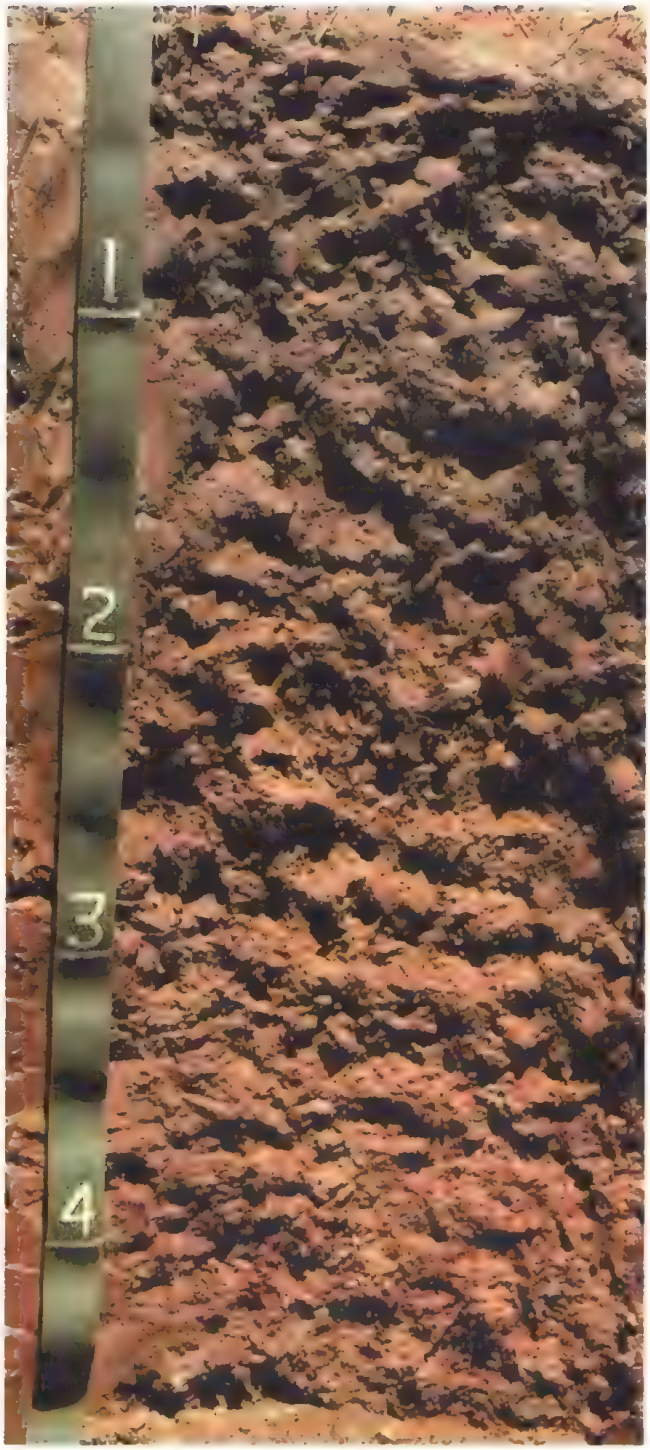


Figure 9.—Typical pedon of Bewleyville soils. These well drained soils are on broad, undulating uplands. The subsoil is at a depth of 9 inches and extends to a depth of more than 60 inches. It is yellowish red at a depth of 27 inches and becomes progressively redder with depth.

Figure 10.—Typical pedon of Dewey soils. These well drained soils are on undulating uplands. The red, fine-textured subsoil is at a depth of 13 inches and extends to a depth of more than 60 inches.

Figure 11.—Typical pedon of Dickson soils. These moderately well drained soils are on uplands. The fragipan is at a depth of 25 inches and extends to a depth of about 48 inches. It overlies fine-textured residuum derived from limestone.

Figure 12.—Typical pedon of Hawthorne soils. These somewhat excessively drained soils are on steep hillsides. Soft, interbedded limestone and siltstone bedrock is at a depth of 25 inches. It extends to a depth of more than 60 inches. Rock fragments make up more than 35 percent of the volume of these soils.

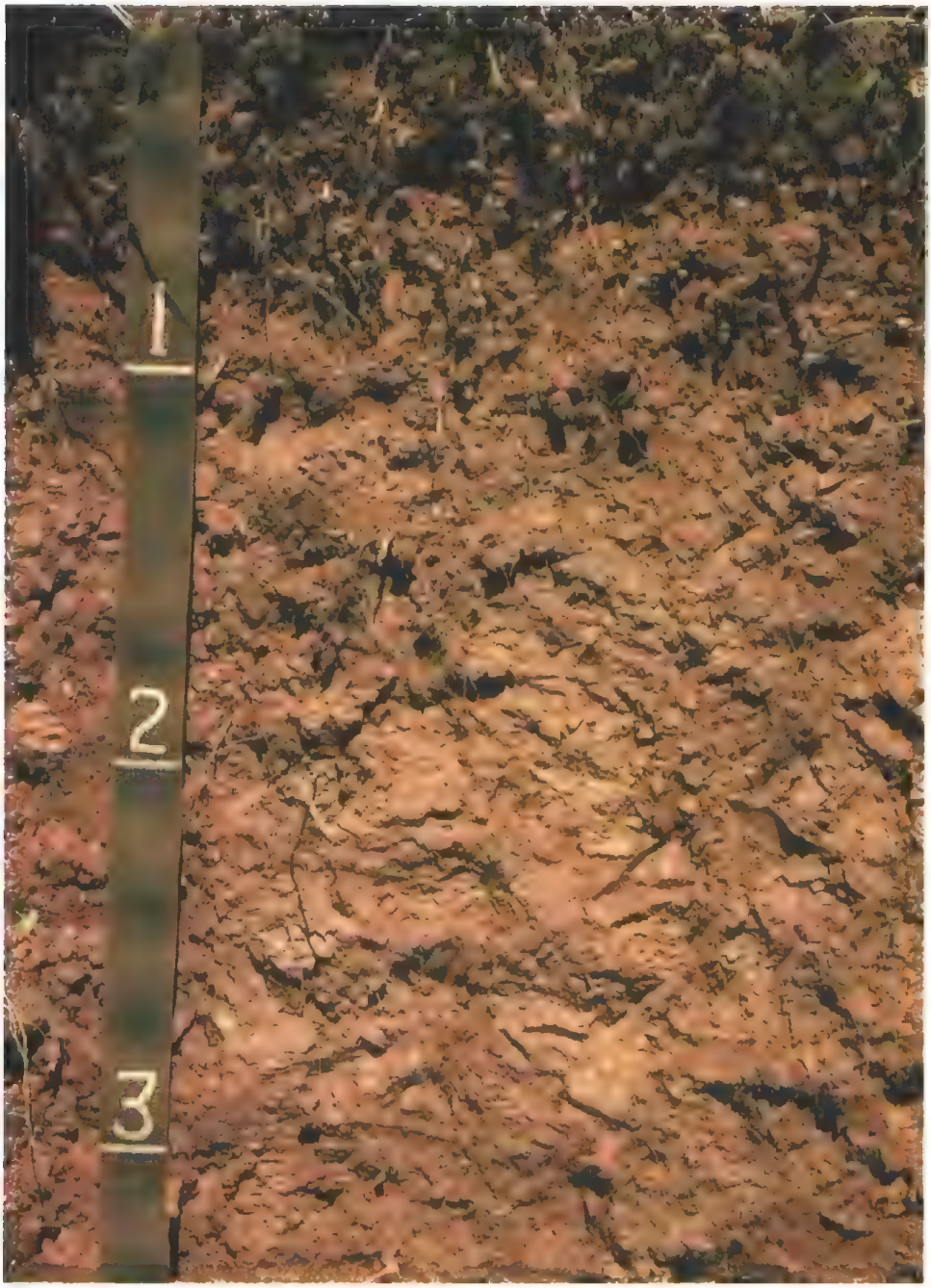


Figure 13.—Typical pedon of Mimosa soils. These well drained soils are on footslopes. The fine-textured subsoil, which extends to a depth of 57 inches, overlies hard limestone bedrock. It has slow permeability and moderate or high shrink-swell potential.

loam; moderate medium granular structure; friable; many fine to coarse roots; 20 percent fragments of chert up to 5 inches across; strongly acid; clear smooth boundary.

BA—7 to 15 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; weak medium subangular blocky structure; friable; common fine to coarse roots; 25 percent fragments of chert up to 5 inches across; strongly acid; gradual smooth boundary.

Bt1—15 to 40 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; moderate medium subangular blocky structure; friable; common fine and medium roots; 30 percent fragments of chert up to 3 inches across; few faint clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—40 to 60 inches; yellowish brown (10YR 5/4) very gravelly silt loam; weak medium subangular blocky structure; friable; few fine roots; 35 percent fragments of chert up to 3 inches across; few distinct clay films on faces of peds; strongly acid.

Solum thickness and depth to bedrock are more than 60 inches. Fragments of chert range from 15 to 35 percent throughout. Reaction is strongly acid or very strongly acid, but in limed areas the surface layer is less acid.

The A horizon has hue of 10YR, value of 3, and chroma of 2 or 3. Texture is gravelly silt loam.

The Bt horizon and the BA horizon, where they occur, have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 to 8. Texture of the fine earth fraction is silt loam or silty clay loam.

Dewey Series

The Dewey series consists of very deep, well drained soils. Permeability is moderate. These soils have a clayey subsoil. They formed in mixed alluvium and residuum. They are on convex ridgetops and upper side slopes on the Highland Rim. Slopes range from 5 to 20 percent.

Dewey soils are near Sengtown, Bewleyville, Mountview, and Dickson soils. Sengtown, Bewleyville, and Mountview soils are in positions similar to those of Dewey soils. Sengtown soils have more than 15 percent gravel throughout. Bewleyville soils have less than 35 percent clay in the upper part of the B horizon. Mountview soils are less red than Dewey soils and have less than 35 percent clay in the upper part of the B horizon. Dickson soils, on upland flats, have a fragipan in the subsoil and are less red than Dewey soils.

Typical pedon of Dewey silt loam, 5 to 12 percent slopes, eroded (fig. 10); 9 miles east of Lafayette on Union Camp Road; 50 feet southwest of intersection with Kirby Road; 1.7 miles north of Gibbs Crossroads:

Ap—0 to 8 inches; reddish brown (5YR 4/4) silt loam; moderate fine and medium granular structure; friable; many fine and very fine roots; strongly acid; clear smooth boundary.

Bt1—8 to 14 inches; red (2.5YR 4/6) silty clay loam; common medium distinct strong brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; friable; common fine roots; common thin distinct clay films; 10 percent fragments of chert up to 3 inches across; strongly acid; gradual smooth boundary.

Bt2—14 to 28 inches; red (2.5YR 4/6) clay; moderate medium subangular blocky structure; few fine roots; firm; many distinct clay films on faces of peds; 10 percent fragments of chert up to 3 inches across; very strongly acid; gradual smooth boundary.

Bt3—28 to 36 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/6) mottles; strong fine and medium angular blocky structure; firm; many prominent dark red (10R 3/6) clay films on faces of peds; 10 percent chert fragments up to 3 inches across; very strongly acid; gradual smooth boundary.

Bt4—36 to 64 inches; red (2.5YR 4/6) clay; common medium distinct yellowish brown (10YR 5/6) and few medium distinct dark yellowish brown (10YR 3/6) mottles; strong fine and medium angular blocky structure; firm; many distinct clay films on faces of peds; 10 percent fragments of chert up to 3 inches across; very strongly acid.

Solum thickness and depth to limestone bedrock are more than 60 inches. The soils are strongly acid or very strongly acid, but in limed areas the surface layer is less acid. Content of coarse fragments is less than 15 percent.

The Ap horizon has hue of 7.5YR or 5YR, value and chroma of 3 or 4. Texture is silt loam.

The Bt horizon has hue of 5YR, 2.5YR, and 10R; value of 3 or 4; and chroma of 6 or 8. It is mottled in shades of brown, yellow, and red. Texture is silty clay or clay, but in some pedons, in the upper few inches it is silty clay loam.

Dickson Series

The Dickson series consists of very deep, moderately well drained soils that have a slowly permeable fragipan in the subsoil. These soils formed in a layer of loess about 2 to 4 feet thick and in the underlying residuum derived from limestone. These

soils are on relatively broad ridgetops on the Highland Rim. Slopes range from 2 to 5 percent.

Dickson soils are near Bewleyville, Mountview, Sugargrove, and Guthrie soils. Bewleyville and Mountview soils, on adjacent landscapes, do not have a fragipan and are well drained. Sugargrove soils, below Dickson soils on side slopes, do not have a fragipan, are well drained, and are cherty throughout. Guthrie soils, in adjacent depressions, are poorly drained.

Typical pedon of Dickson silt loam, 2 to 5 percent slopes, eroded (fig. 11); 0.1 mile west of Highway 10 on Rocky Mound Road; 75 feet south in cultivated field:

Ap—0 to 8 inches; dark yellowish brown (10YR 4/4) silt loam; moderate medium granular structure; friable; common fine and very fine roots; slightly acid; abrupt smooth boundary.

Bw—8 to 20 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; few iron and manganese concretions; strongly acid; gradual smooth boundary.

Btx/E—20 to 25 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct dark yellowish brown (10YR 4/6) and brownish yellow (10YR 6/6) mottles; weak coarse prismatic structure; firm; common fine pores; common distinct clay films in pores; brittle in about 50 or 60 percent of the mass; the E part is light brownish gray (10YR 6/2) silt loam in seams up to 0.5 inch wide between prisms; friable; few fine roots in seams; strongly acid; gradual wavy boundary.

Btx—25 to 48 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2), strong brown (7.5YR 5/6), and red (2.5YR 4/6) mottles; weak coarse and very coarse prismatic structure; firm; common fine and very fine pores; common distinct clay films on faces of peds and in pores; many iron and manganese concretions; brittle in about 60 percent of the mass; strongly acid; gradual wavy boundary.

2Bt—48 to 60 inches; red (2.5YR 4/6) silty clay loam; few fine distinct yellowish red (5YR 5/6) and few fine distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; firm; common distinct clay films on faces of peds; few manganese concretions; strongly acid.

The solum is more than 60 inches in thickness. In most pedons depth to the fragipan ranges from 18 to 30 inches, but in a few pedons it is as deep as 36 inches. Fragments of chert range from none to 5 percent in the Bx horizon and from 5 to 20 percent in the 2Bt horizon. The soil is strongly acid or very strongly acid, but in limed areas the surface layer is less acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 4 or 6. Texture is silt loam.

The E horizon has hue of 10YR, value of 6 or 7, and chroma of 2 or 3. Texture is silt loam.

The Btx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 4 or 6. It has mottles in shades of gray, brown, red, and yellow. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 5YR, 7.5YR, or 2.5YR; value of 4 or 5; and chroma of 4 or 6. It has mottles in shades of gray, brown, or yellow. Texture is silty clay loam or clay.

Guthrie Series

The Guthrie series consists of very deep, poorly drained soils that have a slowly permeable fragipan in the subsoil. These soils formed in silty material in depressions and on broad flats on uplands on the Highland Rim. Slopes range from 0 to 2 percent.

Guthrie soils are near Mountview and Dickson soils. Mountview soils, in higher lying areas, do not have a fragipan and are well drained. Dickson soils, in adjacent, higher lying areas, are moderately well drained.

Typical pedon of Guthrie silt loam, ponded; 1.5 miles west of Lafayette on Highway 52 bypass; south 0.4 mile on old Highway 52 to graveled road; west 0.2 mile; northwest 400 feet:

Ap—0 to 4 inches; dark grayish brown (10YR 5/2) silt loam; weak medium granular structure; friable; many fine, medium, and coarse roots; strongly acid; clear smooth boundary.

E—4 to 12 inches; light brownish gray (10YR 6/2) silt loam; common fine and medium prominent yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; moderate medium granular structure; friable; many fine, medium, and coarse roots; many very fine and fine pores; strongly acid; gradual smooth boundary.

Bg—12 to 27 inches; light brownish gray (10YR 6/2) silt loam; common medium and coarse prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable;

common fine roots; many very fine and fine pores; few iron and manganese nodules up to 1 inch across; strongly acid; abrupt irregular boundary.

Btx—27 to 60 inches; gray (10YR 6/1) silt loam; moderate coarse and very coarse prismatic structure; firm; brittle; few fine pores; few faint clay films on faces of peds and in pores; common to many iron and manganese nodules up to 1 inch across; 10 percent gravel up to 1 inch across; strongly acid.

The solum is more than 60 inches in thickness. Depth to the fragipan ranges from 20 to 30 inches. Gravel does not occur above the fragipan but ranges to 10 percent in the fragipan. The soils are strongly acid or very strongly acid throughout, but in limed areas the surface layer is less acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. In some wooded areas a thin A horizon has value of 3. Texture is silt loam.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. Texture is silt loam.

The Bg horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 or 2. Texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 1 or 2. It has few to common mottles in shades of yellow, brown, or red. In some pedons it is mottled without a dominant matrix color. Texture is silt loam or silty clay loam.

Hawthorne Series

The Hawthorne series consists of moderately deep, somewhat excessively drained soils. Permeability is moderately rapid. These soils formed in residuum derived from cherty limestone and siltstone on side slopes on uplands on the Highland Rim. Slopes range from 12 to 55 percent.

Hawthorne soils are near Sugargrove, Sulphura, Barfield, and Dellrose soils. Sugargrove soils, on adjacent, less sloping side slopes, have less than 35 percent chert in the control section and are more than 60 inches deep to hard bedrock. Sulphura soils, on lower lying side slopes, are 20 to 40 inches deep to hard shale bedrock. Barfield soils, on lower lying side slopes, are less than 20 inches deep to hard bedrock. Dellrose soils, on lower, concave side slopes, have less than 35 percent chert in the control section. On Dellrose soils, solum thickness and depth to bedrock are more than 60 inches.

Typical pedon of Hawthorne gravelly silt loam, 25 to 55 percent slopes (fig. 12); 1,500 feet southwest of Deerlodge Amphitheater in Red Boiling Springs:

Oi—1 inch to 0; partly decomposed leaf litter.

A—0 to 1 inch; dark grayish brown (10YR 4/2) gravelly silt loam; moderate medium granular structure; friable; common fine to coarse roots; 20 percent fragments of chert and soft, highly weathered siltstone up to 3 inches across; strongly acid; abrupt smooth boundary.

E—1 to 7 inches; light yellowish brown (10YR 6/4) gravelly silt loam; weak medium granular structure; friable; common fine to coarse roots; 20 percent fragments of chert and soft, highly weathered siltstone up to 3 inches across; strongly acid; clear smooth boundary.

Bw1—7 to 14 inches; yellowish brown (10YR 5/4) very channery silt loam; weak medium subangular blocky structure; friable; common fine and few medium and coarse roots; 40 percent fragments of soft, highly weathered siltstone and a few chert fragments up to 5 inches across; strongly acid; gradual smooth boundary.

Bw2—14 to 25 inches; yellowish brown (10YR 5/6) very channery silt loam; moderate medium subangular blocky structure; friable; few fine and medium roots; 50 percent fragments of soft highly weathered siltstone and a few chert fragments up to 5 inches across; strongly acid; gradual smooth boundary.

Cr—25 to 60 inches; soft, highly weathered, highly fractured siltstone.

The solum ranges from 18 to 40 inches in thickness. Depth to soft bedrock is 20 to 40 inches. Rock fragments range from 15 to 35 percent in the A and E horizons and from 35 to 60 percent in the B and C horizons. Rock fragments are chert, highly weathered limestone, and siltstone. Reaction is strongly acid to extremely acid throughout.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is gravelly silt loam.

The E horizon, where it occurs, has hue of 10YR, value of 5 or 6, and chroma of 2 to 4. Texture is gravelly silt loam.

The Bw horizon and the Bt horizon, where it occurs, have hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture of the fine earth fraction is silt loam and silty clay loam.

The C horizon, where it occurs, has the same colors and textures as the B horizon. The Cr horizon is soft, highly weathered siltstone interlayered with chert and thin seams of fine earth.

Humphreys Series

The Humphreys series consists of very deep, well drained soils. Permeability is moderately rapid. These

soils formed in gravelly alluvium and colluvium on terraces, footslopes, and fans on the Highland Rim. Slopes range from 2 to 12 percent.

Humphreys soils are near Sugargrove and Skidmore soils. Sugargrove soils are on adjacent side slopes, are more than 60 inches thick in the solum, and do not have a dark surface layer. Skidmore soils, on adjacent flood plains, do not have an argillic horizon and have more than 35 percent coarse fragments in the control section.

Typical pedon of Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded; 4 miles northeast of Westmoreland on Trammel Creek Road; 200 feet east of road, in a pasture:

Ap—0 to 8 inches; dark brown (10YR 3/3) gravelly silt loam; moderate medium granular structure; friable; many fine and very fine roots; 15 percent fragments of chert up to 4 inches across; neutral; clear smooth boundary.

BA—8 to 15 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; weak medium and coarse granular structure; friable; many fine and very fine roots; 15 percent fragments of chert up to 4 inches across; many fine and very fine roots; neutral; clear smooth boundary.

Bt1—15 to 40 inches; yellowish brown (10YR 5/6) gravelly silt loam; moderate medium subangular blocky structure; friable; common fine and very fine roots; few faint clay films on faces of peds; few manganese nodules; 20 percent fragments of chert up to 5 inches across; strongly acid; gradual smooth boundary.

Bt2—40 to 50 inches; yellowish brown (10YR 5/4) gravelly silt loam; moderate medium subangular blocky structure; friable; few fine roots; few faint clay films on faces of peds; few manganese nodules; 20 percent fragments of chert up to 5 inches across; strongly acid; gradual smooth boundary.

C—50 to 60 inches; yellowish brown (10YR 5/4) gravelly silt loam; common medium and coarse distinct yellowish brown (10YR 6/3) and common fine distinct pale brown (10YR 6/3) mottles; massive; friable; few roots; common manganese nodules; 20 percent fragments of chert up to 5 inches across; very strongly acid.

The solum ranges from 30 to 60 inches in thickness. Reaction ranges from very strongly acid to moderately acid, but in limed areas the surface layer is less acid. The amount of chert or gravel ranges from 15 to 35 percent in the solum and to 50 percent in the substratum.

The A horizon has hue of 10YR, value of 3, and chroma of 3 or 4. Texture is gravelly silt loam.

The BA horizon, where it occurs, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. In some pedons it is mottled in shades of brown and yellow. Texture of the fine earth fraction is silt loam or silty clay loam.

The C horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. It has none to common mottles in shades of brown, yellow, and gray. Texture of the fine earth fraction is silt loam or silty clay loam.

Lee Series

The Lee series consists of very deep, poorly drained soils. Permeability is moderate. These soils formed in gravelly alluvium on flood plains on the Highland Rim.

Lee soils are near Sulphura, Sugargrove, and Lindside soils. Sulphura soils, on adjacent side slopes, have more than 35 percent coarse fragments in the control section and are 20 to 40 inches deep to bedrock. Sugargrove soils, on adjacent side slopes, have an argillic horizon and are well drained. Lindside soils, in positions similar to those of Lee soils, are moderately well drained and have less than 15 percent coarse fragments in the control section.

Typical pedon of Lee gravelly silt loam, occasionally flooded; 1.5 miles west of Rocky Mound Community on Rocky Road; 200 yards northeast on graveled road; 100 feet north into field:

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) gravelly silt loam; moderate medium granular structure; friable; many fine and very fine roots; 20 percent fragments of chert up to 2 inches across; moderately acid; abrupt smooth boundary.

Bg1—8 to 16 inches; light brownish gray (10YR 6/2) gravelly silt loam; weak fine subangular blocky structure; friable; common fine and very fine roots; few manganese nodules; 20 percent fragments of chert up to 2 inches across; strongly acid; clear smooth boundary.

Bg2—16 to 38 inches; gray (10YR 5/1) gravelly silt loam; few medium distinct brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common fine roots; few manganese nodules; 20 percent fragments of chert up to 2 inches across; strongly acid; gradual smooth boundary.

Cg—38 to 60 inches; gray (10YR 5/1) gravelly silt loam; common fine and medium distinct brown (10YR 4/3) and few medium distinct light brownish gray (10YR 6/2) mottles; massive; friable; few manganese nodules; 30 percent fragments of chert up to 2 inches across; strongly acid.

The solum ranges from 25 to 45 inches in thickness. Depth to bedrock is more than 60 inches. Fragments of chert range from 15 to 35 percent above a depth of 40 inches and up to 60 percent below that depth. Reaction is strongly acid or very strongly acid, but in limed areas the surface layer is less acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. Texture is gravelly silt loam.

The Bg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or value of 6 and chroma of 2. Texture is gravelly silt loam.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or value of 6 and chroma of 2. Texture is gravelly silt loam or very gravelly silt loam.

Lindside Series

The Lindside series consists of very deep, moderately well drained soils. Permeability is moderate. These soils formed in alluvium on flood plains in the outer part of the Nashville Basin and on the Highland Rim. Slopes range from 0 to 2 percent.

Lindside soils are near Ocana, Armour, and Lee soils. Ocana and Lee soils are in positions similar to those of Lindside soils. Ocana soils contain more than 15 percent chert throughout and are well drained. Armour soils, on higher lying terraces, are well drained and have an argillic horizon. Lee soils are poorly drained and have more than 15 percent chert throughout.

Typical pedon of Lindside silt loam, occasionally flooded; 2 miles north of Rocky Mound on paved road; 1 mile south on graveled road; 0.2 mile east on graveled road; 300 feet east into field:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; moderate medium granular structure; friable; many fine and very fine roots; common manganese nodules; slightly acid; clear smooth boundary.

Bw1—8 to 15 inches; yellowish brown (10YR 5/4) silt loam; common medium faint dark yellowish brown (10YR 4/4) mottles; moderate medium granular structure; friable; many fine and very fine roots; common manganese nodules; slightly acid; clear smooth boundary.

Bw2—15 to 25 inches; yellowish brown (10YR 5/4) silt loam; common fine and medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine roots; common manganese nodules; moderately acid; gradual smooth boundary.

Bg—25 to 40 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brown (10YR 5/3) mottles; weak medium subangular blocky structure; friable; few fine roots; common manganese stains and nodules; moderately acid; gradual smooth boundary.

Cg—40 to 60 inches; light brownish gray (10YR 6/2) gravelly silt loam; common medium distinct brown (10YR 5/3) mottles; massive; friable; common manganese stains and nodules; 15 percent rounded gravel up to 2 inches in diameter; moderately acid.

The solum ranges from 30 to 50 inches in thickness. Depth to bedrock is more than 60 inches. Reaction is moderately acid or slightly acid. Coarse fragments are commonly less than 5 percent in the A and B horizons and range to 30 percent in the C horizon. Depth to low chroma mottles ranges from 15 to 20 inches.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 or 3. Texture is silt loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bg horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is mottled in shades of brown and gray. Texture is silt loam.

The C or Cg horizon has hue of 10YR or 2.5YR, value of 4 to 6, and chroma of 1 to 4. Texture of the fine earth fraction is silt loam or silty clay loam.

Mimosa Series

The Mimosa series consists of deep, well drained soils. Permeability is moderately slow. These soils have a clayey subsoil. They formed in residuum derived from limestone in the outer part of the Nashville Basin. Slopes range from 5 to 45 percent.

Mimosa soils are near Armour, Arrington, Dellrose, and Barfield soils. Armour soils, on lower footslopes and terraces, have a fine-silty control section. Arrington soils, on adjacent flood plains, do not have an argillic horizon; they have a fine-silty control section. Dellrose soils, on adjacent, concave side slopes and benches, are deeper than 60 inches to bedrock and are fine-loamy. Barfield soils, on adjacent side slopes, are less than 20 inches deep to bedrock.

Typical pedon of Mimosa silt loam, 5 to 20 percent slopes, eroded, very rocky (fig. 13); 2,000 feet west of limestone quarry in the Hillsdale community:

Ap—0 to 6 inches; dark brown (10YR 3/3) silt loam;

moderate medium granular structure; friable; common fine and very fine roots; many irregular pores; 5 percent fragments of chert and limestone channers up to 5 inches across; slightly acid; abrupt smooth boundary.

Bt1—6 to 16 inches; brown (7.5YR 4/4) clay; moderate fine and medium subangular blocky structure; firm; common fine roots; few fine pores; few faint clay films on faces of peds; 5 percent fragments of chert and limestone channers up to 5 inches across; common manganese nodules; moderately acid; gradual smooth boundary.

Bt2—16 to 32 inches; yellowish brown (10YR 5/6) clay; few medium distinct brown (7.5YR 4/4) and few fine faint yellowish brown (7.5YR 5/4) mottles; moderate fine angular blocky structure; very firm; few fine roots; common fine pores; many distinct clay films on faces of peds and in pores; common manganese nodules; 5 percent fragments of chert and limestone channers up to 5 inches across; moderately acid; gradual smooth boundary.

Bt3—32 to 44 inches; yellowish brown (10YR 5/6) clay; common fine distinct light yellowish brown (2.5YR 6/4) and common medium distinct brown (7.5YR 4/4) mottles; moderate fine and medium angular blocky structure; very firm; common fine pores; many distinct clay films on faces of peds and in pores; common manganese nodules; 5 percent fragments of chert and limestone channers up to 5 inches across; moderately acid; gradual smooth boundary.

Bt4—44 to 56 inches; yellowish brown (10YR 5/6) clay; common medium distinct light yellowish brown (2.5YR 6/4) and common medium distinct dark yellowish brown (10YR 4/4) mottles; weak medium and coarse angular blocky structure; very firm; few fine pores; many distinct clay films on faces of peds and in pores; many manganese stains and nodules; 5 percent limestone channers; neutral.

R—56 inches; hard limestone bedrock.

Solum thickness and depth to bedrock range from 40 to 60 inches. The soils are moderately acid or strongly acid, but in limed areas the surface layer is less acid and the layer just above bedrock ranges to slightly alkaline. Rock fragments range from none to 5 percent throughout.

The Ap horizon has hue of 10YR, value of 3 to 5, and chroma of 3 or 4. Where it has value of 3 it is less than 7 inches thick. Texture is silt loam or silty clay loam, or, in severely eroded areas, ranges to silty clay.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. It is mottled in shades of brown and red. Texture is clay or silty clay, but in the upper few inches it ranges to silty clay loam.

The BC or C horizon, where it occurs, has hue of 10YR or 2.5YR, value of 5, and chroma of 4 or 6. It has mottles in shades of brown, red, and gray. Texture is clay or silty clay.

Mountview Series

The Mountview Series consists of very deep, well drained soils. Permeability is moderate. These soils formed in a layer of loess 2 to 3 feet thick and in the underlying residuum derived from limestone or old alluvium. They are on relatively narrow, convex, ridgetops on the Highland Rim. Slopes range from 2 to 12 percent.

Mountview soils are near Dickson, Bewleyville, Sengtown, and Sugargrove soils. Dickson soils are on adjacent landscapes, have a fragipan layer, and are moderately well drained. Bewleyville soils have hue of 5YR in the lower part of the Bt horizon and fewer fragments in the 2Bt horizon. Sengtown soils, on adjacent shoulder slopes, have a clayey control section and red colors. Sugargrove soils, on lower lying, steeper side slopes, have more than 15 percent chert.

Typical pedon of Mountview silt loam, 2 to 5 percent slopes, eroded; 2.25 miles west of Lafayette on Brattontown Road; 0.5 mile north on subdivision road; northwest 100 feet:

Ap—0 to 9 inches; dark yellowish brown (10YR 4/4) silt loam; weak fine granular structure; friable; many very fine and fine roots; neutral; clear smooth boundary.

BA—9 to 14 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; common fine roots; slightly acid; gradual smooth boundary.

Bt1—14 to 24 inches; yellowish brown (10YR 5/8) silt loam; moderate medium subangular blocky structure; friable; common fine roots; few fine and medium pores; few faint clay films on faces of peds and in pores; moderately acid; gradual smooth boundary.

Bt2—24 to 35 inches; yellowish brown (10YR 5/8) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; common fine and medium pores; few distinct clay films on faces of peds and in pores; strongly acid; gradual smooth boundary.

2Bt3—35 to 40 inches; red (2.5YR 4/6) gravelly silty clay; common medium prominent brownish yellow (10YR 6/6) and common medium distinct

yellowish red (5YR 5/6) mottles; strong medium subangular blocky structure; firm; common fine and medium pores; common prominent clay films on faces of peds; 20 percent chert fragments; gradual smooth boundary; very strongly acid.

2Bt4—40 to 60 inches; red (2.5YR 4/6) gravelly clay; few medium distinct yellowish red (5YR 5/6) and few fine prominent brownish yellow (10YR 6/6) mottles; strong fine and medium angular blocky structure; firm; common prominent clay films on faces of peds; 30 percent chert fragments; very strongly acid.

Solum thickness and depth to bedrock are more than 60 inches. The loess mantle ranges from 24 to 36 inches in thickness. Content of chert is less than 5 percent in the A and Bt horizons and up to 35 percent in the 2Bt horizon. The soil is very strongly acid or strongly acid, but in limed areas the surface layer is less acid.

The Ap horizon has hue of 10YR, value of 4 to 5, and chroma of 2 to 4. Texture is silt loam.

The BA horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 6 or 8. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 5YR or 2.5YR, value 4 or 5, and chroma of 6. It is mottled in shades of brown, yellow, or red. Texture of the fine earth fraction is silty clay loam, silty clay, or clay.

Ocana Series

The Ocana series consists of very deep, well drained soils. Permeability is moderately rapid. These soils formed in gravelly alluvium on narrow flood plains below the base of the Highland Rim. Slopes range from 0 to 3 percent.

Ocana soils are near Mimosa, Armour, and Skidmore soils. Mimosa soils, on adjacent side slopes, are clayey and have an argillic horizon. Armour soils, on slightly higher terraces and footslopes, have an argillic horizon and have less than 15 percent coarse fragments in the control section. Skidmore soils are in positions similar to those of Ocana soils but have more than 35 percent coarse fragments in the control section.

Typical pedon of Ocana gravelly silt loam, occasionally flooded; 2 miles east of Meadorville Community on Old Bottom Road; 0.9 mile east on Addison Hollow Road; 200 feet southeast on graveled road; 50 feet southwest into field:

Ap—0 to 8 inches; brown (10YR 4/3) gravelly silt loam; moderate medium granular structure; friable; common fine roots; 20 percent gravel; slightly acid; clear smooth boundary.

Bw1—8 to 24 inches; brown (10YR 4/3) gravelly silt loam; weak medium subangular blocky structure; friable; few fine roots; 20 percent gravel; neutral; gradual smooth boundary.

Bw2—24 to 38 inches; dark yellowish brown gravelly silt loam; weak medium subangular blocky structure; friable; 25 percent gravel; neutral; gradual smooth boundary.

C—38 to 60 inches; brown (10YR 4/3) very gravelly silt loam; common medium faint dark yellowish brown (10YR 4/4) mottles; massive; friable; common manganese nodules; 40 percent gravel; neutral.

The solum ranges from 35 to 60 inches in thickness. Gravel ranges from 15 to 35 percent in the control section and as much as 60 percent below. Reaction ranges from moderately acid to neutral in each horizon.

The Ap horizon has hue of 10YR, value and chroma of 3 or 4. Where it has value and chroma of 3, it is less than 10 inches thick. Texture is gravelly silt loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. Texture of the fine earth fraction is silt loam or loam.

Sengtown Series

The Sengtown series consists of very deep, well drained soils. Permeability is moderate. These soils have a clayey subsoil. They formed in residuum derived from cherty limestone. They are on ridgetops and side slopes on the Highland Rim. Slopes range from 5 to 20 percent.

Sengtown soils are near Sugargrove, Dickson, Bewleyville, and Mountview soils. Sugargrove soils are in positions similar to those of the Sengtown soils and have less than 35 percent clay in the control section. Dickson soils are on the flatter ridgetops, contain less than 15 percent coarse fragments, and have a fragipan. Bewleyville and Mountview soils, on wider ridgetops, contain less than 15 percent chert fragments and have less than 35 percent clay in the control section.

Typical pedon of Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded; in Lafayette; on Highway 52; 1.4 miles east of intersection of Highway 10; north 0.3 mile on subdivision road; east 50 feet:

Ap—0 to 5 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; moderate medium granular

structure; friable; many fine and very fine roots; 15 percent chert fragments up to 4 inches across; moderately acid; clear smooth boundary.

Bt1—5 to 14 inches; strong brown (7.5YR 5/6) gravelly silty clay loam; moderate medium subangular blocky structure; friable; common fine and very fine roots; few faint clay films on faces of peds; 20 percent fragments of chert up to 4 inches across; strongly acid; clear smooth boundary.

Bt2—14 to 30 inches; red (2.5YR 5/6) gravelly clay; common medium prominent strong brown (7.5YR 5/6) and few fine prominent yellowish brown (10YR 5/6) mottles; strong medium subangular blocky structure; firm; common fine roots; many distinct clay films on faces of peds and in pores; 20 percent fragments of chert up to 4 inches across; strongly acid; gradual smooth boundary.

Bt3—30 to 48 inches; red (2.5YR 5/6) gravelly clay; common medium distinct yellowish red (5YR 5/6), few fine prominent yellowish brown (10YR 5/6), and few medium distinct reddish brown (2.5YR 4/4) mottles; strong medium angular blocky structure; firm; few roots; common distinct clay films on faces of peds and in pores; 20 percent fragments of chert up to 5 inches across; strongly acid; gradual smooth boundary.

Bt4—48 to 60 inches; red (2.5YR 5/6) gravelly clay; common medium and coarse prominent yellowish brown (10YR 5/6), few fine distinct yellowish red (5YR 5/6), and common fine and medium distinct reddish brown (2.5YR 4/4) mottles; strong fine and medium angular blocky structure; firm; common distinct clay films on faces of peds; 30 percent fragments of chert and soft rock fragments up to 6 inches across; strongly acid.

Solum thickness and depth to limestone bedrock are more than 60 inches. These soils are very strongly acid or strongly acid, but in limed areas the surface layer is less acid. Chert content ranges from 15 to 35 percent throughout the profile.

The Ap horizon has hue of 10YR and 7.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8, but hue ranges to 7.5YR in the upper few inches of the horizon. Texture of the fine earth fraction is silty clay or clay, but in the upper few inches it ranges to silty clay loam.

Skidmore Series

The Skidmore series consists of deep and very deep, well drained soils. Permeability is moderately rapid. These soils formed in gravelly alluvium on narrow flood plains on or below the base of the Highland Rim. Slopes range from 0 to 3 percent.

Skidmore soils are near Hawthorne, Humphreys, Ocana, and Sugargrove soils. Hawthorne soils, on adjacent side slopes, are 20 to 40 inches deep to soft bedrock. Humphreys soils, on slightly higher terraces and footslopes, have an argillic horizon and less than 35 percent coarse fragments in the control section. Ocana soils are in positions similar to those of Skidmore soils and have less than 35 percent coarse fragments in the control section. Sugargrove soils, on adjacent side slopes on uplands, have an argillic horizon and less than 35 percent coarse fragments in the control section.

Typical pedon of Skidmore gravelly loam, occasionally flooded; 2 miles north of Rocky Mound on Williams Road; 0.8 mile southwest on graveled road; 50 feet south of road:

Ap—0 to 9 inches; brown (10YR 4/3) gravelly loam; moderate medium granular structure; friable; 25 percent chert up to 4 inches across; common fine and very fine roots; neutral; clear smooth boundary.

Bw1—9 to 20 inches; dark yellowish brown (10YR 4/4) very gravelly loam; weak fine and medium subangular blocky structure; friable; 35 percent chert up to 4 inches across; common fine roots; neutral; gradual smooth boundary.

Bw2—20 to 39 inches; dark yellowish brown (10YR 4/4) very gravelly loam; weak fine and medium subangular blocky structure; friable; 50 percent chert up to 4 inches across; common fine roots; neutral; gradual smooth boundary.

C1—39 to 50 inches; dark yellowish brown (10YR 4/4) very gravelly loam; common medium distinct pale brown (10YR 6/3) mottles; massive; friable; 60 percent chert up to 4 inches across; few roots; neutral; gradual smooth boundary.

C2—50 to 54 inches; pale brown (10YR 6/3) extremely gravelly loam; many medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; 70 percent chert up to 4 inches across; common manganese nodules; neutral; abrupt smooth boundary.

2Cr—54 to 60 inches; soft, weathered black shale.

The solum ranges from 30 to 40 inches in thickness. Depth to bedrock ranges from 50 to 60 inches or more. The underlying bedrock is either soft, weathered shale in the upper part, or hard bedrock. Content of rock fragments ranges from 20 to 35 percent in the surface layer and averages 35 to 60

percent below the surface layer, but in some individual layers it is higher. Reaction ranges from moderately acid to neutral.

The Ap horizon has hue of 10YR, value of 4, and chroma of 3 or 4. Texture is gravelly loam.

The Bw horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6. Texture of the fine earth fraction is loam.

The C horizon has hue of 10YR, value of 4 to 6, and chroma of 3 or 4. Texture of the fine earth fraction is loam.

Sugargrove Series

The Sugargrove series consists of deep, well drained soils. Permeability is moderately rapid. These soils are sloping to moderately steep. They formed in residuum derived from highly weathered cherty limestone. They are on uplands on the Highland Rim. Slopes range from 5 to 20 percent.

Sugargrove soils are near Dickson, Hawthorne, Skidmore, Sengtown, and Sulphura soils. Dickson soils, on adjacent ridgetops, have a fragipan and are moderately well drained. Hawthorne soils, on lower lying, steeper slopes, have more than 35 percent coarse fragments. Skidmore soils, in adjacent drainageways, do not have an argillic horizon and are subject to flooding. Sengtown soils are in positions similar to those of Sugargrove soils but have a clayey subsoil. Sulphura soils, below Sugargrove soils on steep and very steep side slopes, are less than 40 inches deep over bedrock.

Typical pedon of Sugargrove gravelly silt loam, 12 to 20 percent slopes, eroded; 2 miles north of Rocky Mound on Williams Road; 0.7 mile southwest on graveled road; 400 feet southeast of road:

Ap—0 to 7 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; moderate medium granular structure; friable; 15 percent gravel; many fine and very fine roots; slightly acid; abrupt smooth boundary.

Bt1—7 to 13 inches; yellowish brown (10YR 5/4) gravelly silt loam; few medium distinct yellowish brown (10YR 5/6) and common medium distinct dark yellowish brown (10YR 4/4) mottles; moderate fine and medium subangular blocky structure; friable; common fine roots; few faint clay films on faces of peds; 20 percent gravel; strongly acid; clear smooth boundary.

Bt2—13 to 31 inches; brown (7.5YR 4/4) gravelly silty clay loam; moderate medium subangular blocky structure; friable; common fine roots; common distinct clay films on faces of peds; 30 percent gravel; strongly acid; gradual smooth boundary.

Bt3—31 to 50 inches; yellowish red (5YR 5/6) very gravelly silty clay; common medium distinct brown (7.5YR 4/4) mottles; moderate medium subangular blocky structure; firm; few fine roots; common fine and medium pores; many distinct clay films on faces of peds and in pores; 40 percent gravel and fragments of soft siltstone up to 6 inches across; very strongly acid; gradual wavy boundary.

Cr—50 to 62 inches; highly weathered siltstone and limestone that can be dug with backhoes and bulldozers.

The solum ranges from 35 to 55 inches in thickness. Depth to highly weathered bedrock ranges from 40 to 60 inches. Depth to hard bedrock is more than 60 inches. Bedrock consists of limestone interbedded with some siltstone. Rock fragments range from 15 to 35 percent in the A horizon and in the upper part of the Bt horizon and from about 25 to 40 percent in the lower part of the Bt horizon. Reaction is strongly acid or very strongly acid, but in limed areas the surface layer is less acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is gravelly silt loam.

The BA horizon, where it occurs, has hue of 10YR, value and chroma of 4 to 6. Texture is gravelly silt loam.

In the upper part the Bt horizon has hue of 10YR or 7.5YR, value and chroma of 4 to 6. Texture of the fine earth fraction is silt loam or gravelly silty clay loam. In the lower part the Bt horizon has hue of 10YR, 7.5YR, or 5YR; value of 4 to 6; and chroma of 4 to 8. It has few to many mottles in shades of brown and red. Texture of the fine earth fraction is silty clay loam, silty clay, or clay.

Sulphura Series

The Sulphura series consists of moderately deep, somewhat excessively drained soils. Permeability is moderate. These soils formed in residuum derived from shale or from shale and cherty limestone. They are on side slopes on uplands on the Highland Rim. Slopes range from 25 to 65 percent.

Sulphura soils are near Sugargrove, Hawthorne, Lee, and Mimosa soils. Sugargrove soils, on adjacent higher lying side slopes, are more than 60 inches deep to bedrock and have less than 35 percent chert fragments. Hawthorne soils, on adjacent, higher lying side slopes, have a base saturation of less than 35

percent and do not have hard bedrock within a depth of 40 inches. Lee soils, on adjacent flood plains, are more than 60 inches deep to bedrock and are poorly drained. Mimosa soils, on lower lying side slopes, have a subsoil that is clayey. They are 40 to 60 inches deep to bedrock.

Typical pedon of Sulphura channery silt loam, 25 to 65 percent slopes; 1.5 miles west of Rocky Mound; 0.4 mile north on graveled road; 600 feet east up Sugar Camp Hollow on field road; north 100 feet on side of hill:

Oi—1 inch to 0; partly decomposed leaf litter.
A—0 to 3 inches; brown (10YR 4/3) channery silt loam; moderate medium granular structure; friable; 20 percent channers less than 3 inches across; common fine to coarse roots; strongly acid; clear smooth boundary.
E—3 to 9 inches; brown (10YR 5/3) channery silt loam; weak medium and coarse granular structure; friable; 25 percent channers less than 3 inches across; common fine to coarse roots; strongly acid; gradual smooth boundary.
Bw—9 to 22 inches; yellowish brown (10YR 5/4) very channery silt loam; weak medium subangular blocky structure; friable; 40 percent channers less than 5 inches across; few fine and coarse roots; strongly acid; abrupt irregular boundary.
Cr—22 to 28 inches; soft, black shale interlayered with thin seams of brown silt loam.
R—28 inches; hard black shale.

Depth to hard shale bedrock ranges from 20 to 40 inches. Fragments of shale and chert range from 10 to 25 percent in the A and E horizons and from 35 to 50 percent in the B horizon. Reaction is strongly acid or moderately acid.

The A horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Texture is channery silt loam.

The E horizon, where it occurs, has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is channery silt loam.

The B horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture of the fine earth fraction is mostly silt loam, but ranges to silty clay loam.

The Cr horizon, where it occurs, consists of weathered shale that has brownish soil material filling cracks and coating some fragments.

The R layer is hard, black shale bedrock.

References

(1) American Association of State Highway and Transportation Officials. 1986. Standard specifications for highway materials and methods of sampling and testing. Ed. 14, 2 vols.

(2) American Society for Testing and Materials. 1993. Standard classification of soils for engineering purposes. ASTM Stand. D 2487.

(3) Blankenship, Harold G. 1986. History of Macon County, Tennessee. Monroe Press.

(4) United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Dep. Agric. Handb. 210.

(5) United States Department of Agriculture, Soil Conservation Service. 1975. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. U.S. Dep. Agric. Handb. 436.

(6) United States Department of Agriculture, Soil Conservation Service. 1992. Keys to soil taxonomy. 5th ed. Soil Surv. Staff, Soil Manage. Support Serv. Tech. Monogr. 19.

(7) United States Department of Agriculture, Soil Conservation Service. 1993. Soil survey manual. Soil Surv. Staff, U.S. Dep. Agric. Handb. 18.

(8) Wilson, Charles W., Jr. 1972-1975. Geologic Map and Mineral Resources Summarys. Tenn. Dep. of Conserv., Div. of Geol. Nashville, Tenn.

Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2.0
Low	2.0 to 4.0
Moderate	4.0 to 6.0
High	more than 6.0

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine strata, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil material. Soil material that is, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that is 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained.* These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (accelerated).—Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fill slope. A sloping surface consisting of excavated soil material from a road cut. It commonly is on the downhill side of the road.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. Area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers

especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. The furrow method is described as follows:
Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the

greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Low	less than 2.0 percent
Moderate	2.0 to 4.0 percent
High	more than 4.0 percent

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	more than 6 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid or very rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	less than 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	more than 9.1

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey, classes for simple slopes are as follows:

Nearly level	0 to 2 percent
Gently sloping	2 to 5 percent
Sloping	5 to 12 percent
Moderately steep	12 to 20 percent
Steep	20 to 40 percent
Very steep	40 percent and higher

Classes for complex slopes are as follows:

Nearly level	0 to 2 percent
Undulating	2 to 5 percent
Rolling	5 to 12 percent
Hilly	12 to 20 percent
Steep	20 to 70 percent
Very steep	40 percent and higher

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in content of organic matter than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil

normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1955-87 at Lafayette, Tennessee)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	44.5	24.3	34.4	70	4	21	4.32	2.12	5.62	8	5.2
February----	50.0	28.0	39.0	75	1	29	4.22	2.45	5.36	8	4.2
March-------	60.4	36.6	48.5	82	13	143	5.32	3.02	7.56	8	1.0
April-------	71.2	46.1	58.7	87	26	273	4.64	2.64	6.19	8	.1
May---------	78.8	54.0	66.4	91	33	508	5.13	3.15	6.88	8	.0
June--------	85.3	61.4	73.4	95	45	702	4.42	2.32	6.29	7	.0
July--------	88.3	65.0	76.7	97	51	828	4.92	3.09	6.87	7	.0
August------	87.3	63.3	75.3	96	50	784	3.89	1.88	5.93	6	.0
September	82.0	57.0	69.5	93	38	585	3.76	1.66	5.42	5	.0
October--	72.2	45.5	58.9	87	26	293	3.21	1.26	4.90	5	.0
November----	60.0	37.5	48.8	80	14	80	4.67	2.78	6.32	7	.2
December----	49.4	29.2	39.3	70	2	31	5.41	2.60	7.53	7	.8
Yearly:											
Average----	69.1	45.7	57.4	---	---	---	--		---	---	---
Extreme----	---	---	---	98	2	---		---	---	---	---
Total------	---	---	---	---	---	4,277	53.91	46.91	60.31	84	11.5

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates In Spring and Fall

(Recorded in the period 1955-87 at Lafayette, Tennessee)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 7	Apr. 19	Apr. 23
2 years in 10 later than--	Mar. 30	Apr. 13	Apr. 18
5 years in 10 later than--	Mar. 14	Apr. 1	Apr. 9
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 29	Oct. 21	Oct. 19
2 years in 10 earlier than	Nov. 2	Oct. 25	Oct. 23
5 years in 10 earlier than--	Nov. 11	Nov. 1	Oct. 31

Table 3.--Growing Season

(Recorded in the period 1955-87 at Lafayette, Tennessee)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	213	190	193
8 years in 10	222	198	197
5 years in 10	241	213	204
2 years in 10	260	228	212
1 year in 10	270	236	215

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
AmB	Armour silt loam, 2 to 5 percent slopes	1,937	1.0
AmC2	Armour silt loam, 5 to 12 percent slopes, eroded	687	0.4
Ar	Arrington silt loam, occasionally flooded	492	0.3
BaF	Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes	6,685	3.4
BeB2	Bewleyville silt loam, 2 to 5 percent slopes, eroded	3,213	1.6
BeC2	Bewleyville silt loam, 5 to 12 percent slopes, eroded	1,164	0.6
DaC	Dellrose gravelly silt loam, 5 to 12 percent slopes	92	*
DaD2	Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded	1,040	0.5
DaE2	Dellrose gravelly silt loam, 20 to 30 percent slopes, eroded	3,103	1.6
DeC2	Dewey silt loam, 5 to 12 percent slopes, eroded	611	0.3
DeD2	Dewey silt loam, 12 to 20 percent slopes, eroded	200	0.1
DkB2	Dickson silt loam, 2 to 5 percent slopes, eroded	15,151	7.7
Gu	Guthrie silt loam, ponded	841	0.4
HaD	Hawthorne gravelly silt loam, 12 to 25 percent slopes	8,390	4.3
HaF	Hawthorne gravelly silt loam, 25 to 55 percent slopes	46,578	23.7
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded	2,378	1.2
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes	1,062	0.5
Le	Lee gravelly silt loam, occasionally flooded	260	0.1
Ln	Lindside silt loam, occasionally flooded	741	0.4
MmC2	Mimosa silt loam, 5 to 12 percent slopes, eroded	1,459	0.7
MmD2	Mimosa silt loam, 12 to 20 percent slopes, eroded	884	0.4
MmD3	Mimosa silty clay, 8 to 20 percent slopes, severely eroded	943	0.5
MmE2	Mimosa silt loam, 20 to 35 percent slopes, eroded	1,446	0.7
MoD2	Mimosa silt loam, 5 to 20 percent slopes, eroded, very rocky	2,112	1.1
MrE	Mimosa-Rock outcrop complex, 20 to 45 percent slopes	10,207	5.2
MtB2	Mountview silt loam, 2 to 5 percent slopes, eroded	5,448	2.8
MtC2	Mountview silt loam, 5 to 12 percent slopes, eroded	2,229	1.1
Oc	Ocana gravelly silt loam, occasionally flooded	1,359	0.7
Pt	Pits, quarry	60	*
SeC2	Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded	10,629	5.4
SeD2	Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded	4,626	2.4
Sk	Skidmore gravelly loam, occasionally flooded	4,611	2.4
SrC2	Sugargrove gravelly silt loam, 5 to 12 percent slopes, eroded	24,307	12.4
SrD2	Sugargrove gravelly silt loam, 12 to 20 percent slopes, eroded	23,994	12.2
SuF	Sulphura channery silt loam, 25 to 65 percent slopes	7,561	3.9
	Total	196,500	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
AmB	Armour silt loam, 2 to 5 percent slopes
Ar	Arrington silt loam, occasionally flooded
BeB2	Bewleyville silt loam, 2 to 5 percent slopes, eroded
DkB2	Dickson silt loam, 2 to 5 percent slopes, eroded
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded
Ln	Lindside silt loam, occasionally flooded
MtB2	Mountview silt loam, 2 to 5 percent slopes, eroded
Oc	Ocana gravelly silt loam, occasionally flooded

Table 6.--Land Capability Classes and Yields Per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Alfalfa hay	Tall fescue-ladino
		Bu	Bu	Lbs	Bu	Tons	AUM*
AmB---------- Armour	IIe	115	43	2,900	55	4.5	8.0
AmC2---------- Armour	IIIe	100	38	2,700	50	4.0	7.5
Ar---------- Arrington	IIw	125	45	2,900	50	4.5	8.5
BaF---------- Barfield-Rock outcrop-Ashwood	VIIs	---	---	---	---		---
BeB2---------- Bewleyville	IIe	105	40	2,800	53	4.2	7.5
BeC2---------- Bewleyville	IIIe	95	35	2,600	51	3.8	7.0
DaC ------- Dellrose	IIIe	85	30	2,400	45	3.5	7.0
DaD2---------- Dellrose	IVe	70		2,100	38	3.0	6.5
DaE2---------- Dellrose	VIe	---	---	---	---	---	5.5
DeC2---------- Dewey	IIIe	85	28	2,200	45	3.6	7.0
DeD2---------- Dewey	IVe	70	---	---	40	3.2	6.5
DkB2---------- Dickson	IIe	90	35	2,300	50	---	7.5
Gu ------- Guthrie	Vw	---	---	---	---	---	5.0
HaD---------- Hawthorne	VIs	---	---		---	---	4.0
HaF---------- Hawthorne	VIIs	---	---	---	---	---	---
HuB---------- Humphreys	IIe	90	35	2,600	50	3.5	7.5
HuC---------- Humphreys	IIIe	80	30	2,400	48	3.0	7.0
Le---------- Lee	IIIw	60	25	---	---	---	6.0

See footnote at end of table.

Table 6.--Land Capability Classes and Yields Per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Tobacco	Wheat	Alfalfa hay	Tall fescue-ladino
		Bu	Bu	Lbs	Bu	Tons	AUM*
Ln---------- Lindside	IIw	120	45	2,300	45	4.0	8.5
MmC2---------- Mimosa	IVe	60	---	1,250	40	---	5.0
MmD2---------- Mimosa	VIe	---	---	---	---	---	4.5
MmD3---------- Mimosa	VIe	---	---	---	---	---	3.5
MmE2---------- Mimosa	VIe	---	---	---	---	---	3.5
MoD2---------- Mimosa	VIs	---	---	---	---	---	4.0
MrE---------- Mimosa-Rock outcrop	VIIs	---	---	---	---	---	
MtB2---------- Mountview	IIe	105	38	2,800	50	4.0	7.5
MtC2---------- Mountview	IIIe	90	32	2,600	48	3.5	7.0
Oc---------- Ocana	IIs	90	30	2,400	40	3.5	7.0
Pt**. Pits							
SeC2---------- Sengtown	IIIe	80	30	2,000	42	3.2	7.0
SeD2---------- Sengtown	IVe	70	25	1,800	38	2.8	6.5
Sk---------- Skidmore	IIIs	70	25		35	---	5.5
SrC2---------- Sugargrove	IIIe	80	25	2,200	35	3.2	6.5
SrD2---------- Sugargrove	IVe	65	---	1,800	30	2.8	5.5
SuF---------- Sulphura	VIIe	---	---	---	---		---

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 7. Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity*	
AmB, AmC2---- Armour	Slight	Slight	Slight	Slight	Moderate	Northern red oak----	70	284	Yellow-poplar, loblolly pine, black walnut, northern red oak, white ash.
						Eastern redcedar----	43	213	
						White oak----------	70	284	
						Yellow-poplar-------	95	497	
						Loblolly pine-------	85	568	
Ar---------- Arrington	Slight	Slight	Slight	Slight	Severe	Yellow-poplar-------	100	568	Yellow-poplar, black walnut, loblolly pine, cherrybark oak.
						White oak----------	80	284	
						Southern red oak----	80	284	
						Loblolly pine-------	90	639	
						Black walnut--------	---	--	
BaF**:									
Barfield----	Severe	Severe	Moderate	Severe	Moderate	Eastern redcedar----	40	213	Eastern redcedar.
Rock outcrop.									
Ashwood--------	Severe	Severe	Slight	Slight	Moderate	Southern red oak----	65	213	Loblolly pine, eastern redcedar.
						Loblolly pine-------	80	568	
						Eastern redcedar----	45	284	
BeB2---------- Bewleyville	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	95	497	Yellow-poplar, loblolly pine, black walnut.
						White oak----------	73	284	
						Loblolly pine-------	80	568	
BeC2---------- Bewleyville	Moderate	Slight	Slight	Slight	Moderate	Yellow poplar-------	95	497	Yellow poplar, loblolly pine, black walnut.
						White oak----------	73	284	
						Loblolly pine-------	80	568	
DaC---------- Dellrose	Slight	Slight	Slight	Slight	Moderate	Yellow poplar	98	497	Yellow-poplar, loblolly pine, black walnut, white ash.
						Northern red oak----	76	284	
						Loblolly pine-------	90	639	
DaD2, DaE2 ---- Dellrose	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar-------	98	497	Yellow-poplar, loblolly pine, black walnut. white ash.
						Northern red oak----	76	284	
						Loblolly pine-------	90	639	
DeC2---------- Dewey	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar-------	90	426	Yellow-poplar, black walnut, loblolly pine.
						White oak----------	70	284	
						Southern red oak----	70	284	
						Shortleaf pine------	73	568	
						Virginia pine-------	70	568	
						Loblolly pine-------	78	568	
DeD2---------- Dewey	Moderate	Moderate	Slight	Slight	Moderate	Yellow-poplar-------	90	426	Yellow-poplar, black walnut, loblolly pine.
						White oak----------	70	284	
						Southern red oak----	70	284	
						Shortleaf pine------	73	568	
						Virginia pine-------	70	568	
						Loblolly pine	78	568	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
DkB2---------- Dickson	Slight	Slight	Slight	Moderate	Moderate	Yellow-poplar------- White oak---------- Loblolly pine------- Shortleaf pine------	92 73 80 70	426 284 568 568	Loblolly pine, shortleaf pine, yellow-poplar.
Gu---------- Guthrie	Slight	Severe	Severe	Moderate	Severe	Sweetgum---------- Willow oak----------	90 85	497 426	Sweetgum, willow oak, American sycamore.
HaD---------- Hawthorne	Slight	Moderate	Moderate	Slight	Moderate	Southern red oak---- Shortleaf pine------ Mockernut hickory---	60 60 ---	213 426 --	Loblolly pine, shortleaf pine.
HaF---------- Hawthorne	Moderate	Severe	Moderate	Slight	Moderate	Southern red oak---- Shortleaf pine------ Mockernut hickory---	60 60 ---	213 426 --	Loblolly pine, shortleaf pine.
HuB, HuC Humphreys	Slight	Slight	Slight	Slight	Moderate	Yellow-poplar------- Northern red oak---- Shortleaf pine------ Loblolly pine------- Black walnut--------	100 70 70 90 ---	568 284 568 639 --	Yellow-poplar, black walnut, loblolly pine, cherrybark oak.
Le---------- Lee	Slight	Moderate	Moderate	Moderate	Severe	Yellow-poplar------- Sweetgum---------- Willow oak ---- Water oak---------- White oak----------	90 90 80 80 70	426 497 355 355 284	Yellow-poplar, American sycamore, sweetgum.
Ln ---------- Lindside	Slight	Slight	Slight	Slight	Severe	Northern red oak- Yellow-poplar------- Black walnut ---- White ash---------- White oak---------- Red maple----------	86 100 --- 85 85 ---	355 568 -- 284 355 --	Cherrybark oak, yellow-poplar, black walnut, loblolly pine.
MmC2---------- Mimosa	Slight	Slight	Slight	Slight	Moderate	Southern red oak---- Loblolly pine------- Eastern redcedar----	65 80 45	213 568 284	Loblolly pine, black locust, eastern redcedar
MmD2---------- Mimosa	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak---- Loblolly pine------- Eastern redcedar----	65 80 45	213 568 284	Loblolly pine, black locust, eastern redcedar.
MmD3---------- Mimosa	Slight	Moderate	Severe	Slight	Moderate	Southern red oak---- Loblolly pine------- Eastern redcedar----	60 70 40	213 426 213	Loblolly pine, black locust, eastern redcedar.
MmE2---------- Mimosa	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak---- Loblolly pine------- Eastern redcedar----	65 80 45	213 568 284	Loblolly pine, black locust, eastern redcedar.
MoD2---------- Mimosa	Slight	Slight	Slight	Slight	Moderate	Southern red oak---- Loblolly pine------- Eastern redcedar----	65 80 45	213 568 284	Loblolly pine, black locust, eastern red cedar.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Management concerns					Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Plant competition	Common trees	Site index	Productivity class*	
MrE**:									
Mimosa	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak	65	213	Loblolly pine,
						Loblolly pine	80	568	eastern
						Eastern redcedar	45	284	redcedar.
Rock outcrop.									
MtB2 Mountview	Slight	Slight	Slight	Slight	Moderate	Southern red oak	70	284	Loblolly pine,
						Yellow-poplar	95	497	shortleaf pine,
						Shortleaf pine	65	497	yellow-poplar,
									black walnut,
									southern
									red oak.
MtC2 Mountview	Moderate	Slight	Slight	Slight	Moderate	Southern red oak	70	284	Loblolly pine,
						Yellow-poplar	95	497	shortleaf pine,
						Shortleaf pine	65	497	yellow-poplar,
									black walnut,
									southern
									red oak.
Oc Ocana	Slight	Slight	Slight	Slight	Severe	Yellow-poplar	100	568	Yellow-poplar,
						White oak	80	284	black walnut,
						Loblolly pine	90	639	cherrybark oak,
									loblolly pine.
SeC2 Sengtown	Slight	Slight	Slight	Slight	Moderate	Southern red oak	70	284	Yellow-poplar,
						Yellow-poplar	90	426	loblolly pine,
						Shortleaf pine	70	568	shortleaf
									pine.
SeD2 Sengtown	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak	70	284	Yellow-poplar,
						Yellow-poplar	90	426	loblolly pine,
						Shortleaf pine	70	568	shortleaf
									pine.
Sk Skidmore	Slight	Slight	Moderate	Slight	Moderate	Yellow-poplar	95	497	Yellow-poplar,
						Sweetgum	---	--	American ,
						American sycamore	---	--	sycamore,
						White oak	---	--	cherrybark oak,
						Black walnut	---	--	loblolly pine.
SrC2 Sugargrove	Slight	Slight	Slight	Slight	Moderate	Southern red oak	60	213	Loblolly pine,
						Shortleaf pine	60	426	shortleaf
						Virginia pine	60	426	pine, Virginia
									pine.
SrD2 Sugargrove	Moderate	Moderate	Slight	Slight	Moderate	Southern red oak	60	213	Loblolly pine,
						Shortleaf pine	60	426	shortleaf
						Virginia pine	60	426	pine, Virginia
									pine.
SuF Sulphura	Severe	Severe	Moderate	Moderate	Moderate	Loblolly pine	65	426	Loblolly pine,
						Shortleaf pine	55	355	shortleaf
						Eastern redcedar	35	142	pine, eastern
									redcedar.

* Productivity is the yield in board feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** See description of the map unit for composition and behavior characteristics of the map unit.

Table 8.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
AmB Armour	Slight	Slight	Moderate: slope.	Slight	Slight.
AmC2 Armour	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ar Arrington	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
BaF*: Barfield	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
Rock outcrop.					
Ashwood	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
BeB2 Bewleyville	Slight	Slight	Moderate: slope.	Slight	Slight.
BeC2 Bewleyville	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
DaC Dellrose	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, large stones, slope.
DaD2 Dellrose	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
DaE2 Dellrose	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
DeC2 Dewey	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
DeD2 Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
DkB2 Dickson	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
Gu Guthrie	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
HaD Hawthorne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
HaF---------- Hawthorne	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
HuB---------- Humphreys	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones, droughty.
HuC---------- Humphreys	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, droughty.
Le---------- Lee	Severe: flooding, wetness.	Severe: wetness.	Severe: small stones, wetness.	Moderate: wetness.	Poor: wetness.
Ln---------- Lindside	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Moderate: wetness.	Moderate: flooding.
MmC2---------- Mimosa	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
MmD2---------- Mimosa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
MmD3---------- Mimosa	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
MmE2---------- Mimosa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
MoD2---------- Mimosa	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight----------	Moderate: slope.
MrE*:					
Mimosa----------	Severe: slope.	Severe: slope	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Rock outcrop.					
MtB2---------- Mountview	Slight----------	Slight----------	Moderate: slope.	Severe: erodes easily.	Slight.
MtC2---------- Mountview	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Oc---------- Ocana	Severe: flooding.	Moderate: small stones.	Severe: small stones.	Slight----------	Moderate: small stones, large stones, flooding.
Pt*. Pits					

See footnote at end of table.

Table 8.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
SeC2---------- Sengtown	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope.
SeD2---------- Sengtown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Sk---------- Skidmore	Severe: flooding, small stones.	Severe: small stones.	Severe: small stones.	Slight----------	Severe: small stones.
SrC2---------- Sugargrove	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight----------	Moderate: small stones, slope.
SrD2---------- Sugargrove	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
SuF---------- Sulphura	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 9.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
AmB---- Armour	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
AmC2---- Armour	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ar---- Arrington	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
BaF*:										
Barfield----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Rock outcrop.										
Ashwood----	Very poor.	Fair	Poor	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
BeB2---- Bewleyville	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
BeC2---- Bewleyville	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DaC---- Dellrose	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DaD2---- Dellrose	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DaE2---- Dellrose	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DeC2---- Dewey	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
DeD2---- Dewey	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
DkB2---- Dickson	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Gu---- Guthrie	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
HaD---- Hawthorne	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
HaF---- Hawthorne	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
HuB---- Humphreys	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
HuC---- Humphreys	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

See footnote at end of table.

Table 9. Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
Le Lee	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
Ln Lindside	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
MmC2 Mimosa	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MmD2 Mimosa	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MmD3 Mimosa	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MmE2 Mimosa	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MoD2 Mimosa	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MrE*: Mimosa	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Rock outcrop.										
MtB2 Mountview	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
MtC2 Mountview	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
Oc Ocana	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Poor.
Pt*. Pits										
SeC2 Sengtown	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SeD2 Sengtown	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Sk Skidmore	Fair	Good	Good	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.
SrC2 Sugargrove	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
SrD2 Sugargrove	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
SuF Sulphura	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 10.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
AmB Armour	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
AmC2 Armour	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ar Arrington	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
BaF*: Barfield	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, shrink-swell, low strength.	Severe: slope, depth to rock.
Rock outcrop.						
Ashwood	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: depth to rock, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
BeB2 Bewleyville	Moderate: too clayey.	Slight	Moderate: shrink swell.	Slight	Severe: low strength.	Slight.
BeC2 Bewleyville	Moderate: slope, too clayey.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
DaC Dellrose	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, large stones, slope.
DaD2, DaE2 Dellrose	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DeC2 Dewey	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
DeD2 Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
DkB2 Dickson	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
Gu Guthrie	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding.	Severe: ponding.
HaD, HaF Hawthorne	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
HuB Humphreys	Moderate: wetness.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.	Moderate: small stones, droughty.
HuC Humphreys	Moderate: wetness, slope.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty.
Le Lee	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ln Lindside	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
MmC2 Mimosa	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MmD2 Mimosa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MmD3 Mimosa	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MmE2 Mimosa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
MoD2 Mimosa	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
MrE*: Mimosa	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Rock outcrop.						
MtB2 Mountview	Moderate: too clayey.	Slight	Moderate: shrink-swell.	Slight	Severe: low strength.	Slight.
MtC2 Mountview	Moderate: too clayey, slope.	Moderate: slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Oc Ocana	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: small stones, large stones, flooding.
Pt*. Pits						

See footnote at end of table.

Table 10.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
SeC2---------- Sengtown	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: small stones, slope.
SeD2---------- Sengtown	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Sk ---------- Skidmore	Moderate: depth to rock, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: small stones.
SrC2---------- Sugargrove	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, slope.
SrD2---------- Sugargrove	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
SuF---------- Sulphura	Severe: depth to rock, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 11.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
AmB Armour	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey, thin layer.
AmC2 Armour	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope, thin layer.
Ar Arrington	Severe: flooding.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Good.
BaF*: Barfield	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
Rock outcrop.					
Ashwood	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: depth to rock, too clayey, hard to pack.
BeB2 Bewleyville	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
BeC2 Bewleyville	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
DaC Dellrose	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope, too clayey.	Severe: seepage.	Poor: small stones.
DaD2, DaE2 Dellrose	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: small stones, slope.
DeC2 Dewey	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, hard to pack, slope.
DeD2 Dewey	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
DkB2 Dickson	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness, too clayey.	Moderate: wetness.	Fair: too clayey, wetness.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Gu Guthrie	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
HaD, HaF Hawthorne	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
HuB Humphreys	Moderate: flooding, wetness.	Severe: seepage.	Severe: seepage, wetness.	Severe: seepage.	Poor: small stones.
HuC Humphreys	Moderate: wetness, slope.	Severe: seepage, slope.	Severe: seepage, wetness.	Severe: seepage.	Poor: small stones.
Le Lee	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: small stones, wetness.
Ln Lindside	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: too clayey, wetness.
MmC2 Mimosa	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
MmD2 Mimosa	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
MmD3 Mimosa	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
MmE2 Mimosa	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
MoD2 Mimosa	Severe: percs slowly.	Severe: slope.	Severe: depth to rock, too clayey.	Moderate: depth to rock, slope.	Poor: too clayey, hard to pack.
MrE*: Mimosa Rock outcrop.	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
MtB2 Mountview	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack, small stones.

See footnote at end of table.

Table 11.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MtC2 Mountview	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
Oc Ocana	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding, seepage.	Poor: small stones.
Pt*. Pits					
SeC2 Sengtown	Moderate: percs slowly, slope.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack, small stones.
SeD2 Sengtown	Severe: slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, small stones.
Sk Skidmore	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, depth to rock, seepage.	Severe: flooding, seepage.	Poor: seepage, small stones.
SrC2 Sugargrove	Moderate: depth to rock, percs slowly, slope.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: small stones.
SrD2 Sugargrove	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.
SuF Sulphura	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 12.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
AmB Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
AmC2 Armour	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Ar Arrington	Fair: low strength, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Good.
BaF*: Barfield	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: depth to rock, too clayey, small stones.
Rock outcrop.				
Ashwood	Poor: depth to rock, shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
BeB2 Bewleyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer, too clayey.
BeC2 Bewleyville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, thin layer, slope.
DaC Dellrose	Fair: thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
DaD2 Dellrose	Fair: thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DaE2 Dellrose	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
DeC2 Dewey	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
DeD2---------- Dewey	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
DkB2-- Dickson	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
Gu---------- Guthrie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
HaD---------- Hawthorne	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HaF Hawthorne	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
HuB, HuC---------- Humphreys	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Le---------- Lee	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, wetness.
Ln---------- Lindside	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
MmC2---------- Mimosa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MmD2---------- Mimosa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MmD3---------- Mimosa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MmE2---------- Mimosa	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
MoD2---------- Mimosa	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
MrE*: Mimosa----------	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Rock outcrop.				
MtB2, MtC2---------- Mountview	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.

See footnote at end of table.

Table 12.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Oc---------- Ocana	Good----------	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Pt*. Pits				
SeC2, SeD2---------- Sengtown	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
Sk---------- Skidmore	Fair: area reclaim.	Improbable: small stones.	Probable----------	Poor: small stones, area reclaim.
SrC2---------- Sugargrove	Fair: depth to rock, thin layer.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
SrD2---------- Sugargrove	Fair: depth to rock, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
SuF---------- Sulphura	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 13. -Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
AmB--- Armour	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
AmC2--- Armour	Severe: slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Ar--- Arrington	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
BaF*: Barfield---	Severe: depth to rock, slope.	Severe: thin layer, hard to pack.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Rock outcrop.						
Ashwood---	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
BeB2--- Bewleyville	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
BeC2--- Bewleyville	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
DaC, DaD2, DaE2--- Dellrose	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope----	Slope---	Slope.
DeC2, DeD2--- Dewey	Severe: slope.	Severe: hard to pack.	Deep to water	Slope---	Slope---	Slope.
DkB2--- Dickson	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness.	Erodes easily, rooting depth.
Gu--- Guthrie	Slight---	Severe: piping, ponding.	Ponding, percs slowly.	Ponding, percs slowly, rooting depth.	Erodes easily, ponding, rooting depth.	Wetness, erodes easily, rooting depth.
HaD, HaF--- Hawthorne	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
HuB--- Humphreys	Severe: seepage.	Moderate: piping.	Deep to water	Slope, droughty.	Favorable-	Droughty.
HuC--- Humphreys	Severe: seepage, slope.	Moderate: piping.	Deep to water	Slope, droughty.	Slope---	Slope, droughty.

See footnote at end of table.

Table 13.--Water Management--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Le Lee	Moderate: seepage.	Severe: piping, wetness.	Flooding	Wetness, droughty, flooding.	Wetness	Wetness, droughty.
Ln Lindside	Moderate: seepage.	Severe: piping.	Flooding, frost action.	Flooding, wetness, erodes easily.	Wetness, erodes easily.	Erodes easily.
MmC2, MmD2, MmD3, MmE2, MoD2 Mimosa	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
MrE*: Mimosa	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Rock outcrop.						
MtB2 Mountview	Moderate: seepage, slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
MtC2 Mountview	Severe: slope.	Severe: hard to pack.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Oc Ocana	Severe: seepage.	Moderate: piping.	Deep to water	Flooding	Favorable	Favorable.
Pt*. Pits						
SeC2, SeD2 Sengtown	Severe: slope.	Moderate: hard to pack.	Deep to water	Slope	Slope	Slope.
Sk Skidmore	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, flooding.	Large stones	Large stones, droughty.
SrC2, SrD2 Sugargrove	Severe: slope.	Severe: piping.	Deep to water	Slope	Slope	Slope.
SuF Sulphura	Severe: slope.	Severe: thin layer.	Deep to water	Slope, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 14.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments	Percentage passing sieve number				Liquid limit	Plasticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
AmB, AmC2-------- Armour	0-9	Silt loam--------	CL-ML, CL, ML	A-4	0	90-100	80-100	75-95	70-90	25-35	5-10
	9-36	Silty clay loam, silt loam.	CL	A-4, A-6	0	90-100	80-100	75-95	70-95	30-40	8-18
	36-60	Silty clay loam, silty clay, clay.	ML, MH, GM, GC	A-4, A-6, A-7	0 3	60-100	50-95	45-90	40-85	35-53	9-23
Ar--------------- Arrington	0-32	Silt loam--------	CL, ML, CL-ML	A-4, A-6	0	100	90 100	85-95	75-95	25-40	4-15
	32-60	Silt loam, silty clay loam.	CL, ML, CL-ML	A-4, A-6	0	95-100	90-100	85-100	75-95	25-40	4-15
BaF*: Barfield-------- Rock outcrop.	0-2	Silty clay loam	CL, CH, MH	A-6, A-7	0 10	90-100	85-95	80-90	75-85	35-65	12-35
	2-16	Silty clay, clay, silty clay loam.	CH, MH, CL	A-7, A-6	0-15	70-100	65-90	60-85	55-80	35 70	14-40
	16	Unweathered bedrock.	---	---	---	---	---	---	-	---	---
Ashwood--------- Bewleyville	0-5	Silty clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0-15	95-100	90-100	85-100	70-95	25-49	6-22
	5-32	Clay, silty clay	MH, CH	A 7	0-15	95-100	90-100	85-100	75-95	51-75	20-40
	32	Unweathered bedrock.	---	---	---	---	---	---		---	---
BeB2, BeC2------- Bewleyville	0-9	Silt loam--------	ML, CL ML	A-4	0	100	95-100	95-100	85-100	20-30	2-7
	9-39	Silty clay loam, silt loam.	CL	A-6, A-7	0	95-100	95-100	90-100	85-100	30-45	11-22
	39-60	Clay, silty clay loam.	CL, ML, MH, CH	A-6, A-7	0-5	75-100	75-100	70-95	60-95	35-65	12-32
DaC, DaD2, DaE2-- Dellrose	0-7	Gravelly silt loam.	CL ML, SC, CL, GC	A-4, A-6	0-10	55-90	55-85	45-75	40-70	20-35	5-15
	7-60	Gravelly silty clay loam, gravelly silt loam.	ML, CL, GC, SC	A-4, A-6, A-7	0-15	60-90	55-90	50-75	40-70	30-45	8-18
DeC2, DeD2------- Dewey	0-8	Silt loam--------	CL-ML, CL	A-4, A-6	0	90 100	80-100	75-95	65-80	24-30	5-11
	8-14	Silty clay loam.	CL	A-6	0	90-100	80-100	75-95	70-85	27 40	12-20
	14-64	Clay, silty clay	CH, CL, MH, ML	A-6, A 7	0-2	85-100	75-100	70-95	65-85	38-68	12-34
DkB2 ------------ Dickson	0-8	Silt loam--------	CL-ML, ML	A-4	0	100	95-100	90-100	75-95	20-28	2 7
	8-25	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	100	95-100	95-100	85-95	25-38	5-17
	25-48	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	95-100	90-100	85-100	80-95	25-42	7-20
	48-60	Silty clay loam, clay.	MH, ML, GC, CL	A-6, A-7	0-20	70 100	60-100	55-100	45-95	35-65	12-30

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
Gu---------- Guthrie	0-12	Silt loam--------	ML, CL ML	A 4	0	100	100	90-100	85-95	18-28	2-7
	12-27	Silt loam, silty clay loam.	ML, CL-ML, CL	A-4, A-6	0	100	100	90-100	85-95	23-39	5-15
	27-60	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6, A-7	0	90-100	85-100	80-100	70-95	20-42	5-20
HaD, HaF---------- Hawthorne	0-7	Gravelly silt loam.	ML, CL-ML, GM, GM-GC	A-4	0-10	60-80	55-75	50-70	40-65	18 30	3-9
	7-25	Very channery silty clay loam, very channery silt loam.	ML, CL-ML, GM, GM-GC	A-2, A-4, A-6	0-15	55 75	45 70	40-65	30-60	20-35	3-12
	25-60	Weathered bedrock	---	---	---	---	---	---	---	---	---
HuB, HuC---------- Humphreys	0-8	Gravelly silt loam.	ML, CL-ML, CL, GM-GC	A 4	0-5	60-75	55-75	50-70	35-55	18-28	3-10
	8-50	Gravelly silty clay loam, gravelly clay loam, gravelly silt loam.	CL, GC, SC	A-6	0-5	55-75	50-75	45-70	40 60	28-40	10-16
	50-60	Gravelly silty clay loam, gravelly silt loam.	CL, GC, SC	A 4, A 6, A-2	0-10	45-75	40-75	30-65	20-55	25-35	8-15
Le---------- Lee	0-8	Gravelly silt loam.	CL-ML, GM GC, ML, GM	A-4	0-3	65-85	60-80	50-70	40-70	20-35	3-10
	8 38	Gravelly silt loam, gravelly loam.	CL-ML, GM-GC, GM, ML	A-4	0-5	60-75	55-75	45-70	36-65	20-35	3-10
	38-60	Very gravelly silt loam, gravelly loam.	CL-ML, GM GC, SC-SM, GM	A-4, A-2, A-1	0-5	35-75	30-75	25-70	20-65	20 35	3-10
Ln---------- Lindside	0-8	Silt loam--------	ML, CL, CL-ML	A-4, A-6	0	100	95-100	80-100	55-90	20-35	2-15
	8-40	Silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6	0	100	95-100	90-100	70-95	25-40	4-18
	40-60	Stratified silty clay loam to gravelly sandy loam.	CL, ML, SM, SC	A-2, A-4, A-6	0	60-100	55-100	45-100	30-95	20-40	4-18
MmC2, MmD2------- Mimosa	0-6	Silt loam--------	CL, ML	A-4, A-6, A-7	0	80 100	75 100	65-95	60-90	25-45	7-20
	6-56	Clay, silty clay	CH, MH	A-7	0	95-100	90-100	85-95	80 95	51-65	25-35
	56	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MmD3---------- Mimosa	0-3	Silty clay loam	CL, ML	A-4, A-6, A-7	0	80 100	75-100	65-95	60-90	25-45	7-20
	3 50	Clay, silty clay	CH, MH	A-7	0	95-100	90-100	85-95	80-95	51-65	25-35
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
MmE2, MoD2------- Mimosa	0-6	Silt loam---------	CL, ML	A-4, A-6, A-7	0	80-100	75-100	65-95	60-90	25-45	7-20
	6-56	Clay, silty clay	CH, MH	A-7	0	95-100	90-100	85-95	80-95	51-65	25-35
	56	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
MrE*: Mimosa----------	0-3	Silt loam--------	CL, ML	A-4, A-6, A-7	0	80-100	75-100	65-95	60-90	25-45	7-20
	3-6	Silty clay loam, silty clay, clay.	ML, CL, MH, CH	A-7	0	95-100	90-100	85-95	80-90	45-60	18-28
	6-42	Clay, silty clay	CH, MH	A-7	0	95-100	90-100	85-95	80-95	51-65	25-35
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
MtB2, MtC2------- Mountview	0-9	Silt loam--------	ML, CL-ML	A 4	0	100	95-100	95-100	80-96	20-30	2-7
	9-35	Silt loam, silty clay loam.	CL	A-6, A-7	0	95-100	95-100	90-100	80-96	30-43	10-23
	35-60	Clay, cherty clay, cherty silty clay loam.	CL, ML, MH, CH	A-6, A-7	0-20	75-100	65-100	60-98	50-96	35-65	11-32
Oc- - -------- Ocana	0-8	Gravelly silt loam.	CL-ML, CL, SM, GM	A-4, A-6	0-8	65-80	60-75	50-70	36-65	20-35	3-12
	8-60	Gravelly silt loam, gravelly loam, very gravelly silt loam.	GM-GC, CL, GC, GM	A-4, A-6, A-2	0-8	60-80	55-75	45-65	30-55	20-40	3-18
Pt*. Pits											
SeC2, SeD2------- Sengtown	0-5	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	60-90	55-80	45 75	45 70	25-35	4-10
	5-14	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-5	60-90	55-80	45-75	45-70	25-40	5-20
	14-60	Gravelly clay, gravelly silty clay.	CH, CL, GC	A-7	0-5	50-90	40-75	40-70	40-70	45-70	20-40
Sk--------------- Skidmore	0-9	Gravelly loam----	GM, SM, ML	A-4, A-2	0 10	60 90	40-85	40-75	25-60	<30	NP-7
	9-54	Extremely gravelly loam, very gravelly loam.	GM, GP-GM	A-2, A-1	5-30	35-60	20-50	15-40	10-35	<30	NP-5
	54	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

Table 14.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO	3-10 inches	4	10	40	200		
	In				Pct					Pct	
SrC2, SrD2------- Sugargrove	0-7	Gravelly silt loam.	ML, CL, CL-ML, GM	A-4	0-5	65-85	55 80	45-75	40-75	25-35	4-10
	7-31	Gravelly silt loam, gravelly silty clay loam.	CL-ML, CL, GM-GC	A-4, A-6	0-10	65 85	55-80	45-75	40-70	25-40	6-20
	31-50	Gravelly silty clay loam, very gravelly silty clay.	CL-ML, CL, GM-GC	A-4, A-6	0-10	55-85	55-80	45-75	35-70	25-40	6 20
	50-62	Weathered bedrock	---	---	---	---	---	---	---	---	---
SuP-------------- Sulphura	0-3	Channery silt loam.	ML, CL-ML, CL	A-4	0-8	70-90	65-85	60-80	55-75	20-32	2-10
	3-28	Very channery silt loam, very channery silty clay loam, channery loam.	GC, GM-GC	A-2, A-4, A-6	5-20	45-60	40-55	35-50	30-45	23-32	6-12
	28	Unweathered bedrock.	---	---	---		---	---	---	---	---

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 15.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
AmB, AmC2--------	0-9	15-27	1.30-1.45	0.6-2.0	0.18-0.23	5.1-6.0	Low----------	0.43	5	1-3
Armour	9-36	22-35	1.30-1.50	0.6-2.0	0.17-0.20	5.1-6.0	Low ----------	0.37		
	36-60	30-50	1.35-1.55	0.6-2.0	0.10-0.18	5.1-6.0	Moderate-----	0.37		
Ar---------------	0-32	18-35	1.30-1.45	0.6-2.0	0.19-0.22	6.1-7.8	Low----------	0.37	5	2-4
Arrington	32-60	18-35	1.30-1.45	0.6-2.0	0.19 0.22	6.1 7.8	Low ----------	0.37		
BaF*:										
Barfield--------	0-2	35-55	1.50-1.62	0.2-0.6	0.10-0.15	6.1-7.8	Moderate-----	0.24	1	2-4
	2-16	35-55	1.55-1.65	0.2 0.6	0.09 0.14	6.1-7.8	High---------	0.17		
	16	---	---	---	---	---	----------	----		
Rock outcrop.										
Ashwood---------	0-5	22-40	1.20-1.40	0.6-2.0	0.14-0.18	5.6-7.8	Moderate-----	0.28	2	2-4
	5-32	40-60	1.30-1.45	0.2-0.6	0.12 0.15	5.6 7.8	High ---------	0.24		
	32	---	---	0.0-0.06	---	---	----------	----		
BeB2, BeC2-------	0-9	15-27	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.5	Low----------	0.43	5	.5-2
Bewleyville	9-39	22-35	1.35-1.55	0.6-2.0	0.18-0.20	4.5-6.0	Low----------	0.37		
	39-60	35-50	1.30-1.50	0.6-2.0	0.12-0.17	4.5-5.5	Moderate-----	0.37		
DaC, DaD2, DaE2--	0-7	15-27	1.20 1.40	2.0-6.0	0.10-0.17	4.5-6.0	Low----------	0.24	5	1-3
Dellrose	7-60	20-35	1.20-1.40	2.0-6.0	0.09-0.16	4.5-6.0	Low----------	0.24		
DeC2, DeD2-------	0-8	17-27	1.35-1.50	0.6-2.0	0.18-0.20	4.5-5.5	Low----------	0.32	5	.5-2
Dewey	8-14	35 50	1.45-1.55	0.6-2.0	0.12-0.18	4.5-5.5	Moderate-----	0.24		
	14-64	45-60	1.45-1.55	0.6-2.0	0.12-0.17	4.5-5.5	Moderate-----	0.24		
DkB2-------------	0-8	15-26	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Low----------	0.43	3	.5 2
Dickson	8-25	18-30	1.35-1.55	0.6-2.0	0.18-0.20	4.5-5.5	Low----------	0.43		
	25-48	20-32	1.55-1.75	0.06-0.6	0.05-0.11	4.5 5.5	Low ----------	0.43		
	48-60	35-50	1.35-1.55	0.2-0.6	0.02-0.04	4.5-5.5	Moderate-----	0.28		
Gu-- ---	0-12	10-25	1.35-1.55	0.6-2.0	0.20-0.22	3.6-5.5	Low----------	0.43	3	1-2
Guthrie	12-27	18-30	1.40-1.60	0.6-2.0	0.18-0.20	3.6-5.5	Low----------	0.43		
	27 60	18 32	1.60-1.75	0.06-0.2	0.03-0.05	3.6-5.5	Low----------	0.43		
HaD, HaF---------	0-7	12-25	1.40 1.50	2.0-6.0	0.14-0.18	3.6-5.5	Low----------	0.20	2	.5-2
Hawthorne	7-25	15-32	1.40-1.50	2.0-6.0	0.05-0.10	3.6-5.5	Low----------	0.10		
	25-60	---	-	0.0-0.2	---	---	----------	----		
HuB, HuC---------	0-8	12-25	1.35 1.50	2.0-6.0	0.12-0.18	4.5-6.0	Low----------	0.28	5	1-3
Humphreys	8-50	18-32	1.35-1.55	2.0-6.0	0.10-0.15	4.5-6.0	Low----------	0.24		
	50 60	18-32	1.40-1.60	2.0-6.0	0.06-0.12	4.5-6.0	Low----------	0.24		
Le----------	0 8	18-27	1.35-1.50	0.6-2.0	0.12-0.18	4.5-6.5	Low----------	0.28	5	1-3
Lee	8-38	18-27	1.35-1.50	0.6-2.0	0.09-0.14	4.5-5.5	Low----------	0.28		
	38-60	18-27	1.35-1.50	0.6-2.0	0.06-0.12	4.5-5.5	Low----------	0.28		
Ln---------------	0-8	15-27	1.20-1.40	0.6-2.0	0.20-0.26	5.1-7.8	Low----------	0.32	5	1-3
Lindside	8-40	18-35	1.20-1.40	0.2-2.0	0.17-0.22	5.1-7.8	Low----------	0.37		
	40-60	18-35	1.20 1.40	0.2-6.0	0.12-0.18	5.6-7.8	Low----------	0.32		

See footnote at end of table.

Table 15.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	g/cc	In/hr	In/in	pH				Pct
MmC2, MmD2------- Mimosa	0-6 6-56 56	24-40 45-60 ---	1.30-1.50 1.35-1.55 ---	0.6-2.0 0.06-0.2 ---	0.12-0.20 0.10-0.16 ---	4.5-6.0 4.5-6.0 ---	Low---------- Moderate----- ----------	0.37 0.24 ----	3	.5-2
MmD3--------- Mimosa	0-3 3-50 50	24-40 45-60 ---	1.30-1.50 1.35-1.55 ---	0.6-2.0 0.06 0.2 ---	0.12-0.20 0.10-0.16 ---	4.5-6.0 4.5-6.0 ---	Low---------- Moderate----- ----------	0.37 0.24 ----	3	.5-2
MmE2, MoD2------- Mimosa	0-6 6-56 56	24-40 45-60 ---	1.30-1.50 1.35 1.55 ---	0.6-2.0 0.06-0.2 ---	0.12-0.20 0.10-0.16 ---	4.5-6.0 4.5-6.0 ---	Low---------- Moderate----- ----------	0.37 0.24 ----	3	.5 2
MrE*: Mimosa---------- Rock outcrop.	0-3 3-6 6-42 42	24-40 35-55 45-60 ---	1.30 1.50 1.30-1.50 1.35-1.55 ---	0.6-2.0 0.2-0.6 0.06-0.2 ---	0.12-0.20 0.12-0.16 0.10-0.16 ---	4.5-6.0 4.5-6.0 4.5-6.0 ---	Low---------- Moderate----- Moderate----- ----------	0.37 0.28 0.24 ----	3	.5-2
MtB2, MtC2------- Mountview	0-9 9-35 35-60	15-25 20-35 35-55	1.35-1.55 1.40-1.60 1.30-1.50	0.6-2.0 0.6 2.0 0.6-2.0	0.18-0.22 0.17-0.20 0.10-0.15	4.5-5.5 4.5-5.5 4.5-5.5	Low---------- Low---------- Moderate-----	0.43 0.43 0.32	5	.5-2
Oc--------------- Ocana	0-8 8 60	18-27 20-32	1.35-1.50 1.35-1.50	2.0-6.0 2.0-6.0	0.12-0.18 0.10-0.17	5.6-7.3 5.6-7.3	Low Low----------	0.28 0.28	5	1-3
Pt*. Pits										
SeC2, SeD2------- Sengtown	0-5 5-14 14-60	12-27 23 40 40-60	1.35-1.55 1.35-1.55 1.35-1.60	0.6-2.0 0.6-2.0 0.6-2.0	0.10-0.16 0.10-0.15 0.08-0.12	4.5-6.0 4.5-6.0 4.5-6.0	Low -- Low---------- Moderate-----	0.28 0.24 0.24	5	.5-2
Sk--------------- Skidmore	0-9 9-54 54	7-18 7-18 ---	1.20-1.40 1.30-1.60 ---	2.0-6.0 2.0-6.0 0.0-0.2	0.07-0.13 0.04-0.10 ---	5.6-7.8 5.6-7.8 ---	Low---------- Low---------- --------	0.17 0.17 -	5	<2
SrC2, SrD2------- Sugargrove	0-7 7-31 31-50 50-62	10-27 18-35 18-35 ---	1.20-1.40 1.30-1.50 1.30-1.50 ---	0.6-2.0 0.6-2.0 0.6-2.0 0.0-0.2	0.14-0.19 0.12-0.16 0.09-0.14 ---	4.5 5.5 4.5-5.5 4.5 5.5 ---	Low---------- Low---------- Low---------- ----------	0.28 0.28 0.28 ----	3	.5-2
SuF---- ------ Sulphura	0-3 3-28 28	15-25 18-32 ---	1.30-1.50 1.35-1.55 ---	0.6-2.0 0.6-2.0 0.00-0.06	0.12-0.17 0.07-0.14 ---	5.1-6.0 5.1-6.5 ---	Low---------- Low---------- ----------	0.24 0.24 ----	2	.5-2

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 16.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
AmB, AmC2 Armour	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
Ar Arrington	B	Occasional	Very brief	Dec-Mar	4.0-6.0	Apparent	Jan-Mar	>60	---	Low	Low.
BaF*:											
Barfield	D	None	---	---	>6.0	---	---	8-20	Hard	High	Low.
Rock outcrop.											
Ashwood	C	None			>6.0			20 40	Hard	High	Low.
BeB2, BeC2 Bewleyville	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.
DaC, DaD2, DaE2 Dellrose	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
DeC2, DeD2 Dewey	B	None	---	---	>6.0	---	---	>60	---	High	Moderate.
DkB2 Dickson	C	None	---	---	2.0-3.0	Perched	Jan Apr	>60		Moderate	Moderate.
Gu Guthrie	D	None	---	---	+2-1.0	Perched	Dec-May	>60	---	High	High.
HaD, HaF Hawthorne	B	None	---	---	>6.0	---	---	20-40	Soft	Low	High.
HuB Humphreys	B	Rare	---	---	5.0-6.0	Apparent	Jan-Mar	>60	---	Moderate	Moderate.
HuC Humphreys	B	None	---	---	5.0-6.0	Apparent	Jan-Mar	>60	---	Moderate	Moderate.
Le Lee	D	Occasional	Very brief	Dec-Mar	0.5-2.0	Apparent	Dec-Apr	>60	---	High	High.
Ln Lindside	C	Occasional	Very brief to brief	Dec Mar	1.5 3.0	Apparent	Dec Apr	>60	- -	Moderate	Low.
MmC2, MmD2, MmD3, MmE2, MoD2 Mimosa	C	None	---	---	>6.0	---		40 60	Hard	High	Moderate.
MrE*:											
Mimosa	C	None		--	>6.0	---	---	40-60	Hard	High	Moderate.
Rock outcrop.											
MtB2, MtC2 Mountview	B	None	---	---	>6.0	---	---	>60	---	Moderate	Moderate.

See footnote at end of table.

Table 16.--Soil and Water Features--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Bedrock		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Uncoated steel	Concrete
					Ft			In			
Oc---------- Ocana	B	Occasional	Very brief	Dec-Mar	>6.0	---	---	>60	---	Low------	Low.
Pt*. Pits											
SeC2, SeD2-------- Sengtown	B	None--------	---	---	>6.0	---		>60	---	High-----	Moderate.
Sk---------- Skidmore	B	Occasional	Very brief	Dec-Mar	4.0-6.0	Apparent	Jan-Mar	>50	Hard	Low------	Moderate.
SrC2, SrD2-------- Sugargrove	B	None--------	---	---	>6.0	---	---	>40	Soft	Moderate	Moderate.
SuF---------- Sulphura	D	None--------	-	---	>6.0	---	---	20-40	Hard	Low------	Moderate.

* See description of the map unit for composition and behavior characteristics of the map unit.

Table 17.--Classification of the Soils

Soil name	Family or higher taxonomic class
Armour	Fine-silty, mixed, thermic Ultic Hapludalfs
Arrington	Fine-silty, mixed, thermic Cumulic Hapludolls
Ashwood	Fine, mixed, thermic Typic Argiudolls
Barfield	Clayey, mixed, thermic Lithic Hapludolls
Bewleyville	Fine-silty, siliceous, thermic Typic Paleudults
Dellrose	Fine-loamy, mixed, thermic Humic Hapludults
Dewey	Clayey, kaolinitic, thermic Typic Paleudults
Dickson	Fine-silty, siliceous, thermic Glossic Fragiudults
Guthrie	Fine-silty, siliceous, thermic Typic Fragiaquults
Hawthorne	Loamy-skeletal, siliceous, thermic Ruptic-Ultic Dystrochrepts
Humphreys	Fine-loamy, siliceous, thermic Humic Hapludults
Lee	Fine-loamy, siliceous, acid, thermic Typic Haplaquepts
Lindside	Fine-silty, mixed, mesic Fluvaquentic Eutrochrepts
Mimosa	Fine, mixed, thermic Typic Hapludalfs
Mountview	Fine-silty, siliceous, thermic Typic Paleudults
Ocana	Fine-loamy, mixed, thermic Dystric Fluventic Eutrochrepts
Sengtown	Fine, mixed, thermic Typic Paleudalfs
Skidmore	Loamy-skeletal, mixed, mesic Dystric Fluventic Eutrochrepts
Sugargrove	Fine-loamy, mixed, thermic Typic Hapludults
Sulphura	Loamy-skeletal, siliceous, thermic Ruptic-Alfic Dystrochrepts

NRCS Accessibility Statement

This document is not accessible by screen-reader software. The Natural Resources Conservation Service (NRCS) is committed to making its information accessible to all of its customers and employees. If you are experiencing accessibility issues and need assistance, please contact our Helpdesk by phone at 1-800-457-3642 or by e-mail at ServiceDesk-FTC@ftc.usda.gov. For assistance with publications that include maps, graphs, or similar forms of information, you may also wish to contact our State or local office. You can locate the correct office and phone number at http://offices.sc.egov.usda.gov/locator/app.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

MACON COUNTY, TENNESSEE

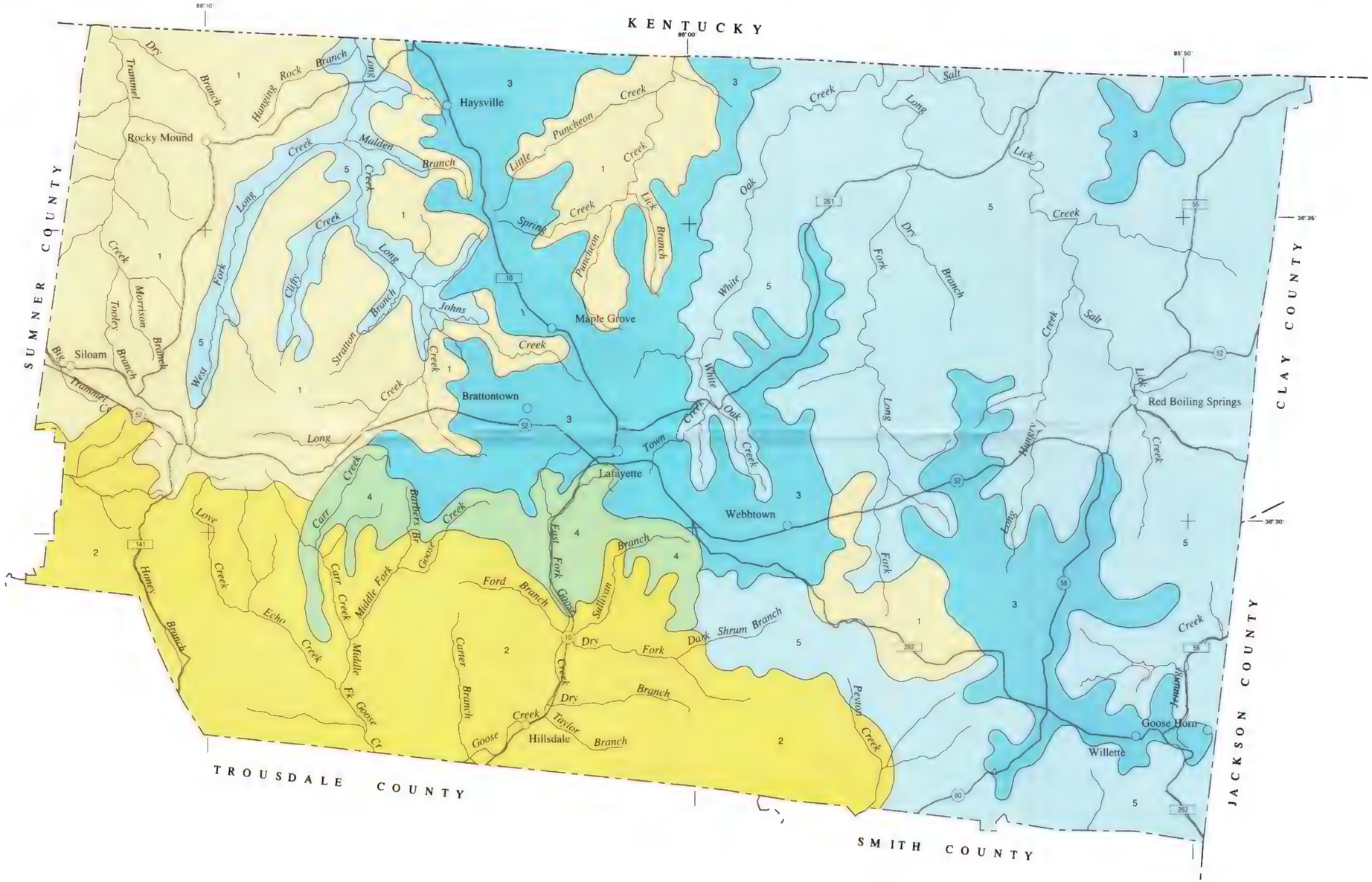
Scale 1:100000

1 0 1 2 3

MILES

1 0 1 2 3 4 5 6

KILOMETERS



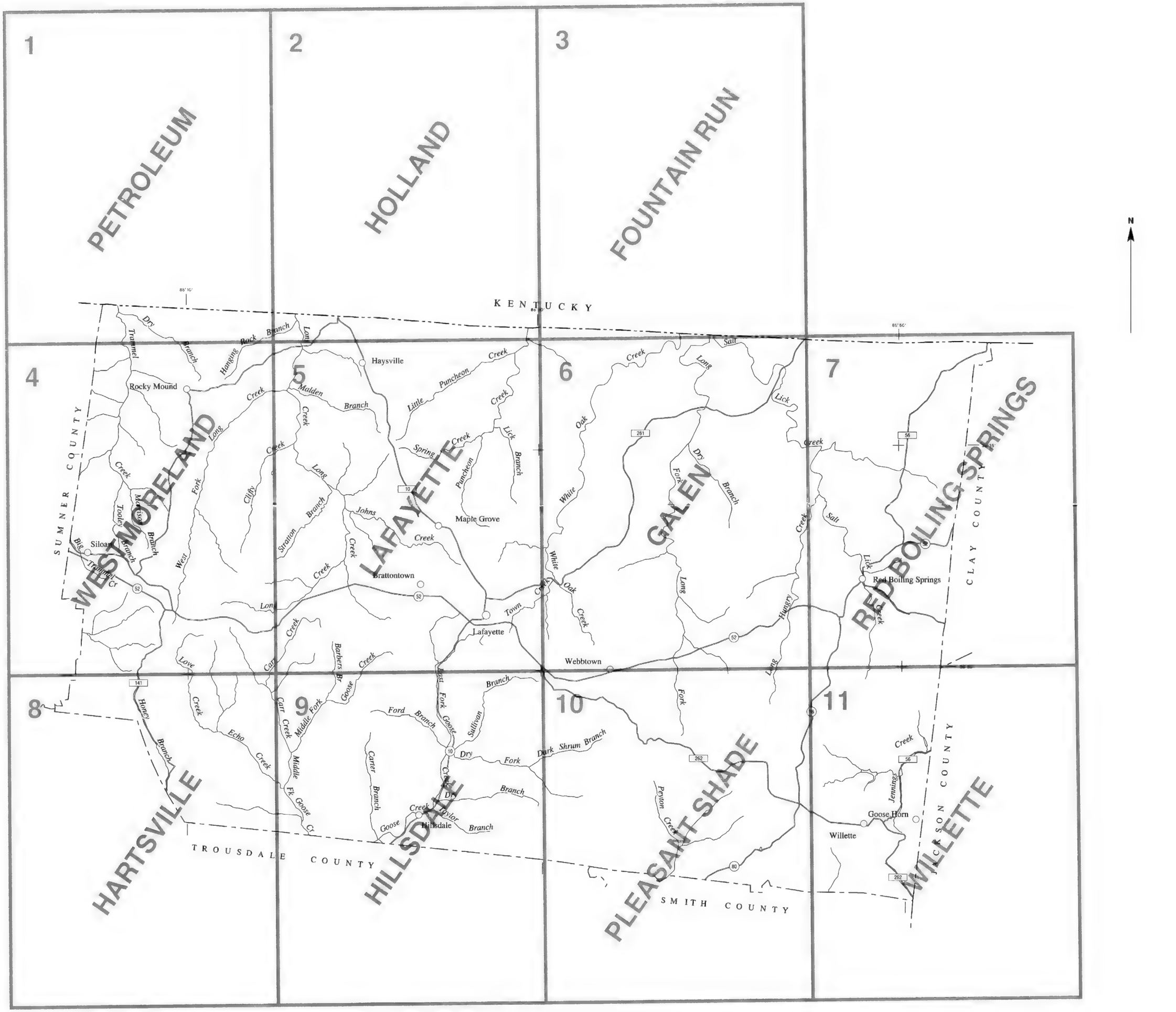
SOIL LEGEND*

1	SUGARGROVE-DICKSON
2	MIMOSA-HAWTHORNE
3	DICKSON-MOUNTVIEW-BEWLEYVILLE
4	HAWTHORNE-BARFIELD
5	HAWTHORNE-SUGARGROVE-SENGTOWN

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1991

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.


1
2
3
4
5
6
7
8
9
10
11
PETROLEUM
HOLLAND
FOUNTAIN RUN
WESTMORELAND
LAFAYETTE
GALEN
RED BOILING SPRINGS
HARTSVILLE
HILLSDALE
PLEASANT SHADE
WILLETTE
KENTUCKY
SUMNER COUNTY
CLAY COUNTY
JACKSON COUNTY
TROUSDALE COUNTY
SMITH COUNTY
Haysville
Rocky Mound
Maple Grove
Brattontown
Lafayette
Webbtown
Red Boiling Springs
Goose Horn
Willette
Hillsdale
Siloam
85°10'
85°05'
N
INDEX TO MAP SHEETS
MACON COUNTY, TENNESSEE
Scale 1:100000
MILES
KILOMETERS

SOIL LEGEND

Map symbols consists of a combination of letters and numbers. The first two letters are listed alphabetically and represent the kind of soil. The first letter is a capital letter and the second letter is a small letter. A capital letter following the small letter indicates the class of slope. Symbols without a slope letter are for nearly level soils or miscellaneous areas. A number 2 following the slope letter indicates that the soil is eroded and a 3 indicates it is severely eroded.

SYMBOL	NAME
AmB	Armour silt loam, 2 to 5 percent slopes
AmC2	Armour silt loam, 5 to 12 percent slopes, eroded
Ar	Arrington silt loam, occasionally flooded
BaF	Barfield-Rock outcrop-Ashwood complex, 20 to 70 percent slopes
BeB2	Bewleyville silt loam, 2 to 5 percent slopes, eroded
BeC2	Bewleyville silt loam, 5 to 12 percent slopes, eroded
DaC	Dellrose gravelly silt loam, 5 to 12 percent slopes
DaD2	Dellrose gravelly silt loam, 12 to 20 percent slopes, eroded
DaF2	Dellrose gravelly silt loam, 20 to 30 percent slopes, eroded
DeC2	Dewey silt loam, 5 to 12 percent slopes, eroded
DeD2	Dewey silt loam, 12 to 20 percent slopes, eroded
DkB2	Dickson silt loam, 2 to 5 percent slopes, eroded
Gu	Guthrie silt loam, ponded
HaD	Hawthorne gravelly silt loam, 12 to 25 percent slopes
HaF	Hawthorne gravelly silt loam, 25 to 55 percent slopes
HuB	Humphreys gravelly silt loam, 2 to 5 percent slopes, rarely flooded
HuC	Humphreys gravelly silt loam, 5 to 12 percent slopes
Le	Lee gravelly silt loam, occasionally flooded
Ln	Lindside silt loam, occasionally flooded
MmC2	Mimosa silt loam, 5 to 12 percent slopes, eroded
MmD2	Mimosa silt loam, 12 to 20 percent slopes, eroded
MmD3	Mimosa silty clay, 8 to 20 percent slopes, severely eroded
MmE2	Mimosa silt loam, 20 to 35 percent slopes, eroded
MoD2	Mimosa silt loam, 5 to 20 percent slopes, eroded, very rocky
MrE	Mimosa-Rock outcrop complex, 20 to 45 percent slopes
MtB2	Mountview silt loam, 2 to 5 percent slopes, eroded
MtC2	Mountview silt loam, 5 to 12 percent slopes, eroded
Oc	Ocana gravelly silt loam, occasionally flooded
Pt	Pits, quarry
SeC2	Sengtown gravelly silt loam, 5 to 12 percent slopes, eroded
SeD2	Sengtown gravelly silt loam, 12 to 20 percent slopes, eroded
Sk	Skidmore gravelly loam, occasionally flooded
SrC	Sugargrove gravelly silt loam, 5 to 12 percent slopes
SrD	Sugargrove gravelly silt loam, 12 to 20 percent slopes
SuF	Sulphura channery silt loam, 25 to 65 percent slopes

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Field sheet matchline and neatline

AD HOC BOUNDARY
(label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

ROAD EMBLEM & DESIGNATIONS

- State

DAMS

- Large (to scale)
- Medium or Small
  (Named where applicable)

PITS

- Mine or quarry

WATER FEATURES

DRAINAGE

- Perennial, single line
- Intermittent
- Drainage end

LAKES, PONDS AND RESERVOIRS

- Perennial

MISCELLANEOUS WATER FEATURES

- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

- SOIL DELINEATIONS AND SYMBOLS — HaD / HaF
- SHORT STEEP SLOPE
- SOIL SAMPLE (normally not shown) — S
- MISCELLANEOUS
  - Rock outcrop (includes sandstone and shale) — V

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
PETROLEUM QUADRANGLE
SHEET NUMBER 1 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

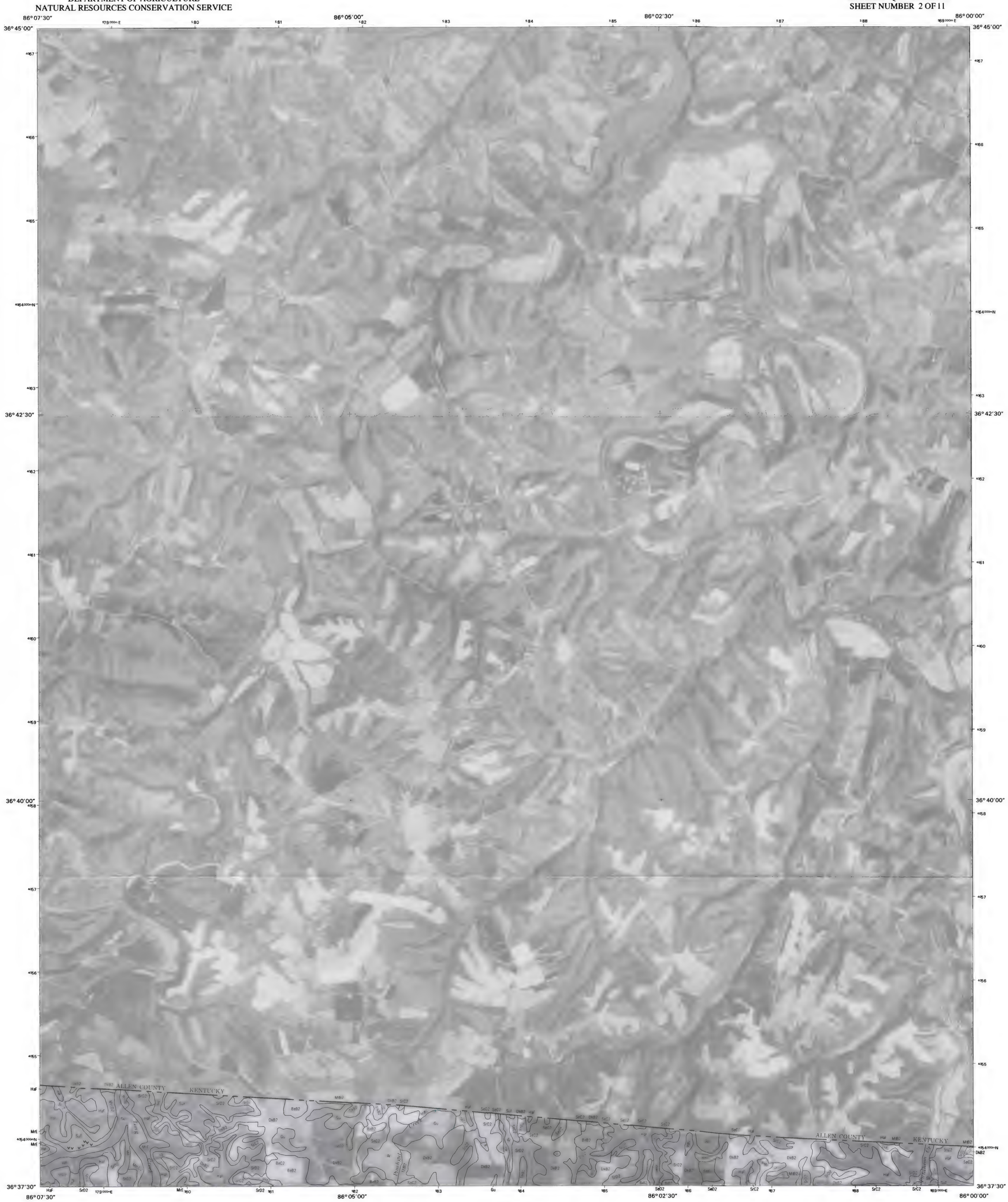
1	2	3	1 ALLEN SPRINGS 2 SCOTTSVILLE 3 AUSTIN
4		5	4 ADOLPHUS 5 HOLLAND
6	7	8	6 TURNERS STATION 7 WESTMORELAND 8 LAFAYETTE

INDEX TO ADJOINING 7.5 MAPS

PETROLEUM, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 1 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
HOLLAND QUADRANGLE
SHEET NUMBER 2 OF 11



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 SCOTTSVILLE 2 AUSTIN 3 TRACY 4 PETROLEUM 5 FOUNTAIN RUN 6 WESTMORELAND 7 LAFAYETTE 8 GALEN
4		5	
6	7	8	

INDEX TO ADJOINING 7.5 MAPS

HOLLAND, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 2 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
FOUNTAIN RUN QUADRANGLE
SHEET NUMBER 3 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3
4		5
6	7	8

1 AUSTIN
2 TRACY
3 FREEDOM
4 HOLLAND
5 GAMALIEL
6 LAFAYETTE
7 GALEN
8 RED BOILING SPRINGS

INDEX TO ADJOINING 7.5 MAPS

FOUNTAIN RUN, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 3 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
WESTMORELAND QUADRANGLE
SHEET NUMBER 4 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3
4		5
6	7	8

1 ADOLPHUS
2 PETROLEUM
3 HOLLAND
4 TURNERS STATION
5 LAFAYETTE
6 BETHPAGE
7 HARTSVILLE
8 HILLSDALE

INDEX TO ADJOINING 7.5 MAPS

WESTMORELAND, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 4 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
LAFAYETTE QUADRANGLE
SHEET NUMBER 5 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 PETROLEUM 2 HOLLAND 3 FOUNTAIN RUN
4		5	4 WESTMORELAND 5 GALEN
6	7	8	6 HARTSVILLE 7 HILLSDALE 8 PLEASANT SHADE

INDEX TO ADJOINING 7.5 MAPS

LAFAYETTE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 5 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
GALEN QUADRANGLE
SHEET NUMBER 6 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

1	2	3	1 HOLLAND 2 FOUNTAIN RUN 3 GAMALIEL 4 LAFAYETTE 5 RED BOILING SPRINGS 6 HILLSDALE 7 PLEASANT SHADE 8 WILLETTE
4		5	
6	7	8	

INDEX TO ADJOINING 7.5 MAPS

GALEN, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 6 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
RED BOILING SPRINGS QUADRANGLE
SHEET NUMBER 7 OF 11

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

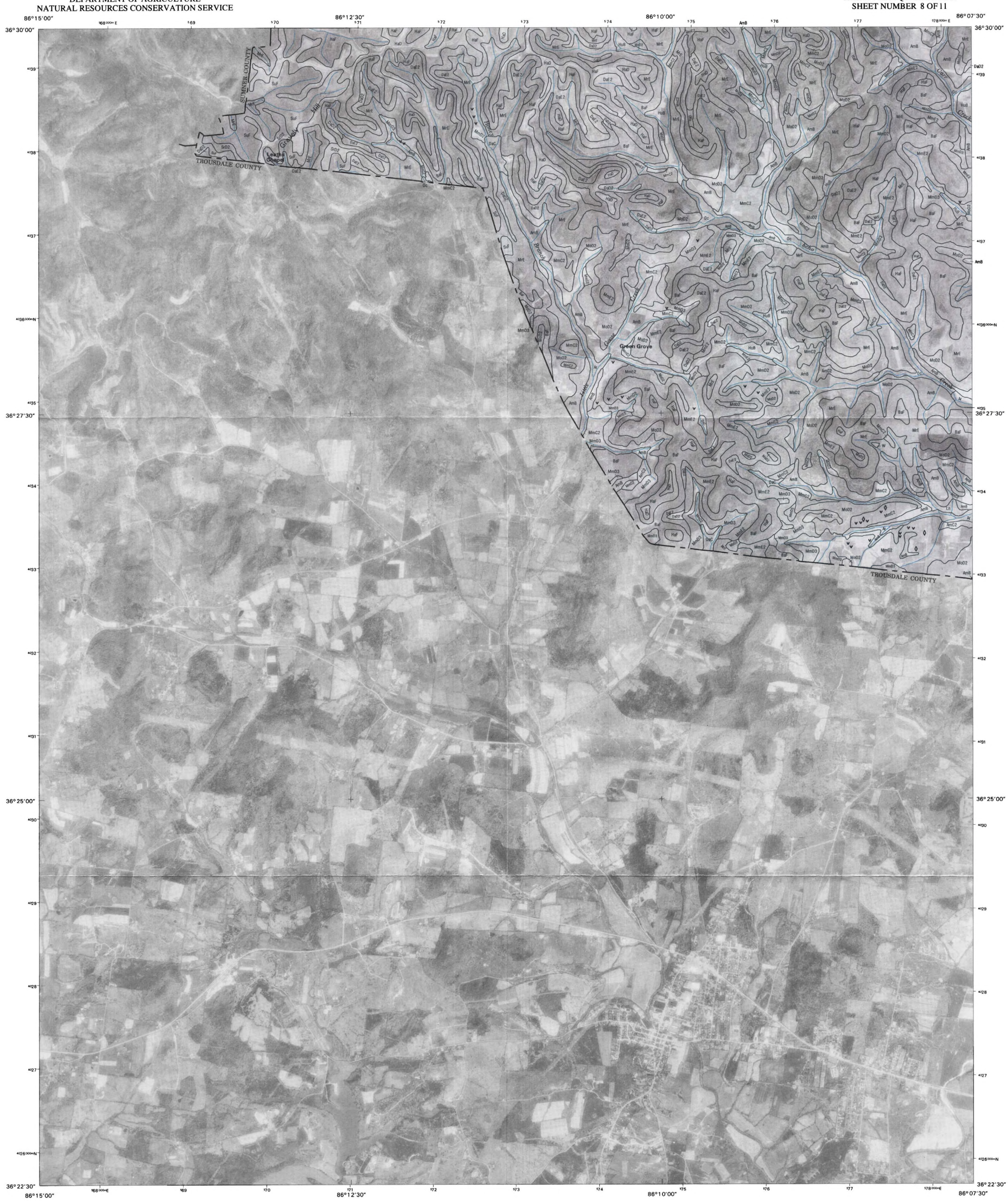
1	2	3	1 FOUNTAIN RUN 2 GAMALIEL 3 TOMPKINSVILLE
4		5	4 GALEN 5 UNION HILL 6 PLEASANT SHADE
6	7	8	7 WILLETTE 8 WHITLEYVILLE

INDEX TO ADJOINING 7.5 MAPS

RED BOILING SPRINGS, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 7 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
HARTSVILLE QUADRANGLE
SHEET NUMBER 8 OF 11



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

1 0 1
KILOMETERS

1000 0 1000 2000 3000 4000 5000 6000 7000
FEET

1 0 1
MILES

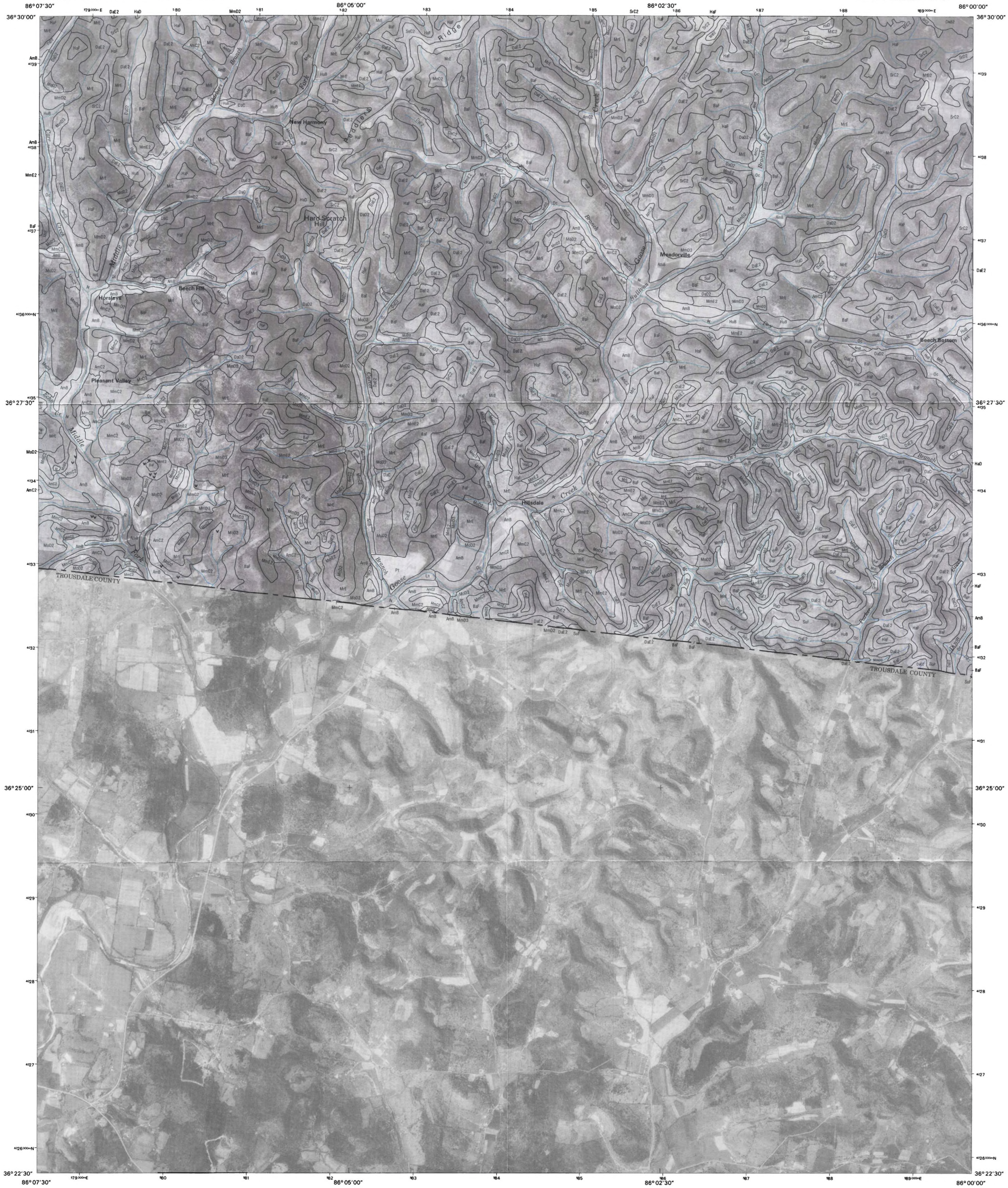
1	2	3	1 TURNERS STATION 2 WESTMORELAND 3 LAFAYETTE 4 BETHPAGE 5 HILLSDALE 6 HUNTERS POINT 7 BELLWOOD 8 DIXON SPRINGS
4		5	
6	7	8	

INDEX TO ADJOINING 7.5 MAPS

HARTSVILLE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 8 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
HILLSDALE QUADRANGLE
SHEET NUMBER 9 OF 11



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

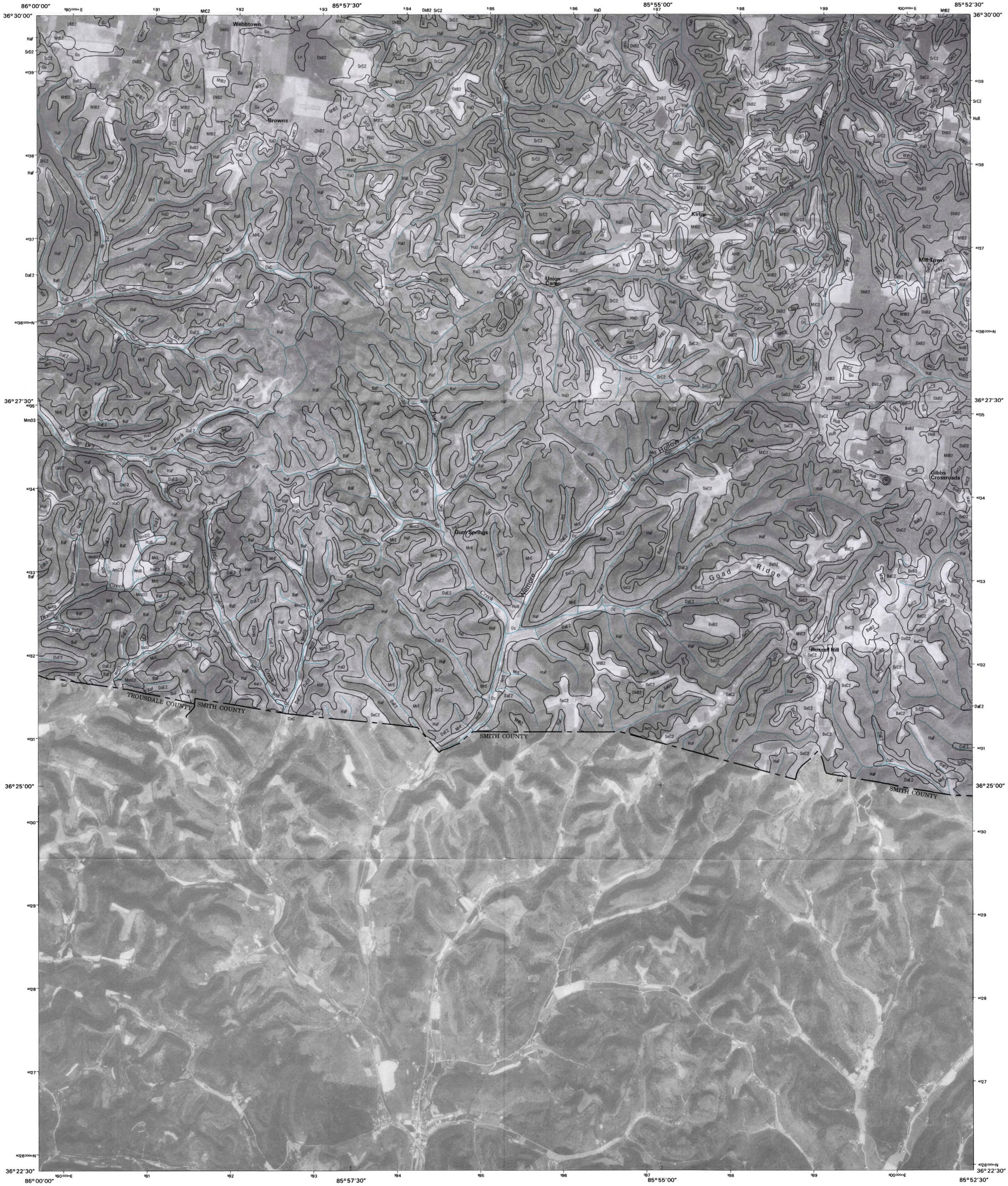
1	2	3	1 WESTMORELAND 2 LAFAYETTE 3 GALEN 4 HARTSVILLE 5 PLEASANT SHADE 6 BELLWOOD 7 DIXON SPRINGS 8 CARTHAGE
4		5	
6	7	8	

INDEX TO ADJOINING 7.5 MAPS

HILLSDALE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 9 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
PLEASANT SHADE QUADRANGLE
SHEET NUMBER 10 OF 11



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS

FEET

MILES

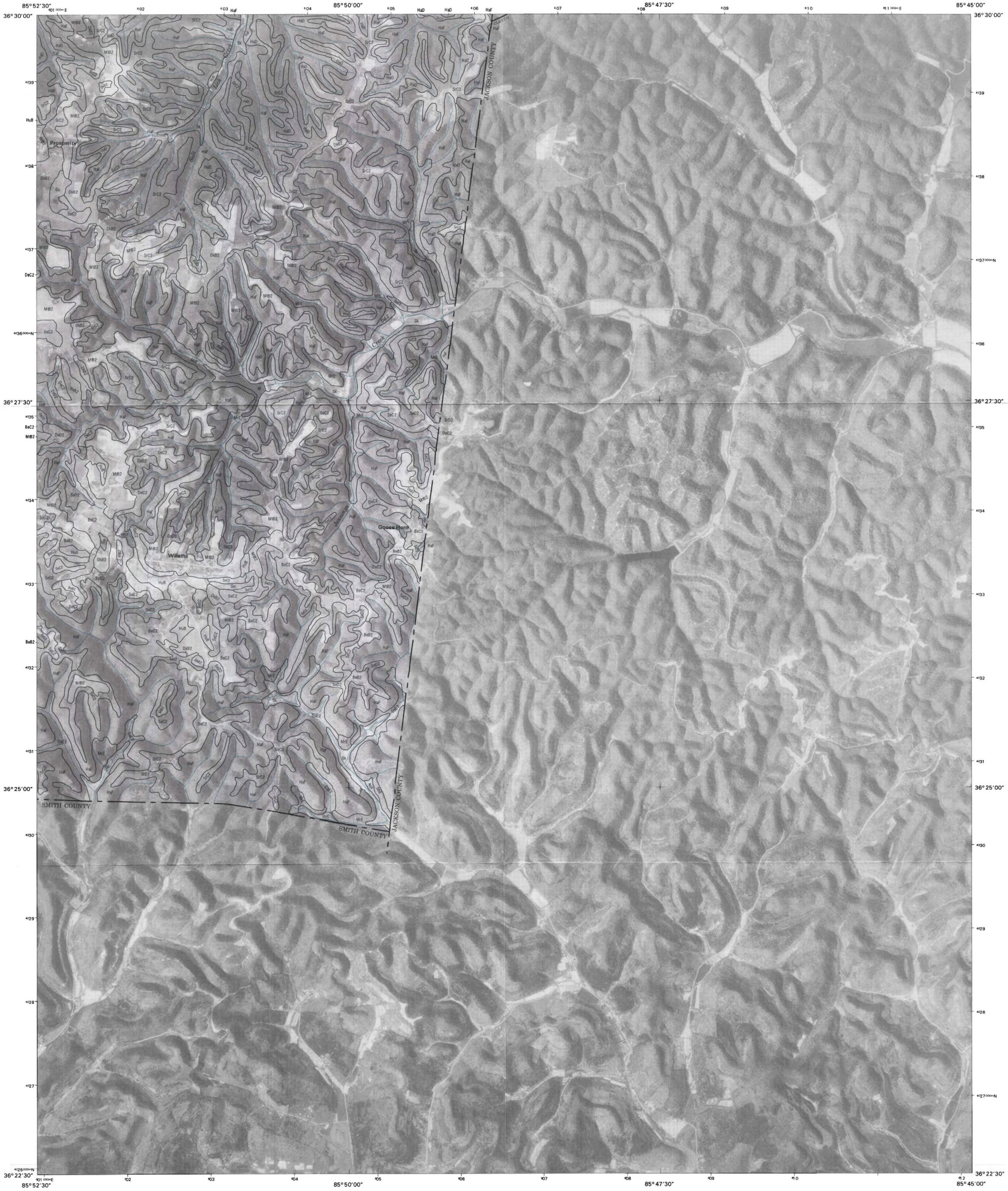
1	2	3	1 LAFAYETTE 2 GALEN 3 RED BOILING SPRINGS 4 HILLSDALE 5 WILLETTE 6 DIXON SPRINGS 7 CARTHAGE 8 GRANVILLE
4		5	
6	7	8	

INDEX TO ADJOINING 7.5 MAPS

PLEASANT SHADE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 10 OF 11

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

MACON COUNTY, TENNESSEE
WILLETTE QUADRANGLE
SHEET NUMBER 11 OF 11



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service. Base maps are orthophotographs prepared by the U.S. Dept. of Interior, Geological Survey, from (1975-1982) aerial photography. Hydrography information was acquired from NRCS.

North American Datum of 1927 (NAD27). Clarke 1866 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUADRANGLE LOCATION

SCALE 1:24000

KILOMETERS 1 0 1

FEET 1000 0 1000 2000 3000 4000 5000 6000 7000

MILES 1 0 1

1	2	3	1 GALEN 2 RED BOILING SPRINGS 3 UNION HILL
4		5	4 PLEASANT SHADE 5 WHITLEYVILLE
6	7	8	6 CARTHAGE 7 GRANVILLE 8 GAINESBORO

INDEX TO ADJOINING 7.5 MAPS

WILLETTE, TENNESSEE
7.5 MINUTE SERIES
SHEET NUMBER 11 OF 11